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DISEASES

OF

INFANTS AND CHILDREN,

WITH THEIR

HOMŒOPATHIC TREATMENT.

EDITED BY

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DISEASES OF THE GLANDS.

DISEASES OF THE INFANTILE LIVER.

The liver is the largest gland in the infant, and as its *chief* function is to digest or emulsify fat, and to saponify any of the fatty acids that may have been set free by (butyric fermentation) gastric digestion and as the food of the infant is an oily emulsion, we can understand the great importance of its normal condition. Another important function of the liver is to supply the blood with sugar. Derangements of the liver must be followed by serious effects upon the child, chiefly in deranging its digestion of milk. The earlier these disorders occur. *i. e.*, during the flow of colostrum, the more serious will be the consequences.

Diseases of the liver, if we except fatty degeneration, are not so common in children as in advanced life. Among 40,000 cases of sick children, Steiner found 425 cases of independent disease of the liver. Of these icterus neonatorum and catarrhalis were the most common, and next to them rank fatty and amyloid degeneration. Cirrhosis, syphilitic and tubercular deposit in the liver and hepatitis parenchymatosa were not common. Cancer of the liver is almost unknown and echinococcus, rare among children. The liver and its diseases deserve the special attention of pædologists.

Development of the Liver.

The liver, as we have seen p. 46, begins to be developed as early as the third week of fœtal life. It gains rapidly in size so that at the fifth week it is one-half the weight of the entire embryo. It is, at this time divided into several lobes. By the third lunar month, the liver extends nearly to the pelvis, and almost fills the abdomen; the right side now begins to gain upon the left and the gall bladder makes its first appearance.

The subsequent changes consist chiefly in its consolidation and diminution in size. At birth the proportion of the liver to the body is as 1 to 18 or 20 while in the adult it is as 1 to 36. The difference between the right and left lobes is still great, but, during the first year the right lobe increases a little, or remains stationary, while the left one is reduced nearly one-half.

According to Meckel, the liver of the new-born weighs one-fourth heavier than that of a child eight or ten months old; and as the weight of the whole body is more than double during the same time it is obvious that this change in proportion of the two must be principally effected at this epoch.

The liver seems to be engorged during fœtal life, in the depuration of the blood (as appears from the accumulation of *meconium*, which is chiefly altered bile, in the intestinal canal at birth); but at the same time it is serving as a blood making organ, containing many free nuclei and protoplasmic masses, and this is probably its principal function before birth. (Carpenter.)

CONGENITAL DISEASES OF THE LIVER.

This organ is often the seat of sanguineous congestion during intra-uterine life. It is frequently of a dark red color. In two instances Billard found its tissue considerably softened, and diffusing an odor of sulphuretted hydrogen; in both these cases, the children had arrived at the full term, possessed a good constitution, and externally exhibited no evidence of wasting. In the liver of a newly born child, he found a number of small tuberculous granulations; they also existed in the spleen and lungs. They will be considered when we come to treat of diseases of the lymphatics. As to the quantity and physical qualities of the bile in infants, nothing is more variable. Passive congestions of the liver are the most frequent lesions of this organ in young infants; a condition easily understood since the hepatic circulation is under the direct dependence of the general circulation, and would consequently experience promptly the disorders which supervene in the functions of the circulating apparatus.

In order properly to appreciate the changes which take place in the liver, we must first make known its various aspects in a state of health. In nearly all newly born children, the liver is of a deep reddish brown, and is almost always gorged with blood, which issues in numerous drops whenever the organ is cut, and is generally black and fluid; the gall-bladder is long, and of little volume, is filled with viscid bile of a porraceous green. In proportion as the child advances in age, the sanguineous engorgement becomes less, and the bile somewhat more abundant, and the gall-bladder more distended. The consistence of the tissue of the liver is such, that it can always be cut smoothly, and does not tear except upon the application of considerable force.

CONGESTION OF THE LIVER.

The slightest impediment to the circulation gives rise to passive congestions of the liver. These congestions are very common in infants at birth, and vary considerably with respect to the quantity of blood accumulated in the tissue of the organ. It is sometimes also found there in so great a quantity as to produce a sort of sanguineous exudation on the surface of the liver, particularly on the convex portion, which is in this case covered with a layer of blood over its whole extent. Billard found in several infants, an effusion of blood in the abdomen as the result of this turgescence. The symptoms presented by children affected with hepatic congestion, are so obscure as to make it difficult to detect the existence of the disease; they are the same as those of pulmonary congestion. In asphyxia of new-born children, for instance, there is nothing more common than to find the liver considerably gorged with fluid black blood; the large abdominal vessels and the whole of the circulatory apparatus are in the same condition. Hepatic congestion then arises from a kind of reflux of the sanguineous fluid towards the abdominal organs, among which the liver, by reason of its great vascularity, is peculiarly disposed to injection and engorgement.

The congestions of the liver would appear sometimes to change the nature of its secretion; in some infants, where the liver was very much injected, Billard found the gall-bladder distended and filled with thick bile, of a black green, and even bloody. The same condition has been found in infants at the Chicago Foundling's Home. Sometimes in the place of bile is a black ropy blood. It might be supposed that in this child, the liver, changed its texture, could not produce in the blood which it receives for the biliary secretion, the vital or physiological modification, which this fluid must undergo to form bile.

The treatment of hepatic congestions ought to be the same as that of intestinal or thoracic congestions, since this condition occurs in all three of them at the same time, all apparently being closely connected by the various branches of the same circulatory trunk. *Belladonna* and *Aconite* are prominent remedies.

ICTEROID NEONATORUM. (YELLOW GUM.)

This is a physiological coloring of the skin setting in after birth. It should be understood as having no special relation to disease of the liver. The skin, and in fact all of the mucous membranes undergo a violent injection at birth. The skin is intensely injected, and this no doubt causes an anæsthesia of the surface that protects the infant from its new environment. From a bland warm media to a cold and rough one, the change is very great, and nature throws out a proper protection of violent injection, which is a safeguard against the irritating influence of the sudden change. This partial anæsthesia subsides and is followed by a hyperæsthesia. The great hyperæmia subsides gradually. In most cases a true inflammation follows, giving rise to the popular red gum (strophulus neonatorum.) As in all cases of hyperæmia, as from blows, etc., a discoloration of the skin occurs, so this primary hyperæmia is followed by a yellow color, which, we think, is not inaptly termed icteroid neonatorum.

The *cause* of this form of discoloration is the hematic pigment remaining in the meshes of the capillaries and tissues, as in cases of traumatic ecchymosis. This form of trouble may be increased by acrid soaps, too long exposure of the infant to the cool air while washing it, rough handling or rough clothing.

The *diagnosis* is not difficult. If the whites of the eyes are carefully examined, they will be found free from discoloration, not as we find them in true icterus or jaundice.

The *prognosis* is favorable in most cases.

The *treatment* needed by such cases is care and gentle management. If the skin is so much obstructed by hematin, more work will be thrown upon the mucous membrane of the intestine, and the congestion may extend up the common bile-duct and give rise to a case of true icterus. The surface should be laved with oil instead of water and soap, or in many cases where the discoloration is marked the child should not be washed at all, except the portions soiled. The anointing with oil will help to carry off the pigment into the circulation. If there is a stupor or excessive drowsiness, *Arnica* is indicated. If there is a feverish restlessness, *Aconite* is the remedy. If the anæsthesia is so profound as to amount to a stupor, *Opium* will be needed. If there seems a hyperæsthesia the child so sensative as to fret and worry all the time, *Chamomilla* is indicated. Usually the discoloration is so slight as to give rise to no marked symptoms and therefore may need no treatment except care.

ICTERUS CATARRHALIS (INFANTILE JAUNDICE).

Icterus nascentum is a term applied to true jaundice that occurs during the first week of infant life. In this form of icterus the conjunctiva as well as the skin is intensely yellow. The urine is also of a deep yellow color, showing the presence of bile.

Kehrer, who carefully examined 690 new-born, found in about two-thirds more or less distinct indications of icterus within the first week of life. Of these there were 6.6 per cent. more males than females. In primiparæ, infants 4.2 per cent. more than in multiparæ; while in premature infants the per cent. was 17.7 more than in those at full term. It is noteworthy that the discoloration is very frequent over the pelvis, and that the early passage of the meconium or its retention has no influence in its production.

The *symptoms* of this form of icterus are more grave than those in simple "yellow gum." The staining of the skin is deeper, sometimes amounting almost to a bronze. The infant is usually sleepy and stupid, or it may be very restless, feverish and colicky. This latter, is due to the diminished flow of bile and consequent indigestion. The stools will be either dry and white, or else watery, with lumps of undigested curds. The conjunctiva are deeply injected, and the eyes become very sensitive to the light.

The *cause* of this form of "pernicious icterus," as Vogel calls it, is variously given by various writers. Vogel regards it as a complication of phlebitis umbilicalis. Frerichs thinks the causation should be sought in a diminished tension of the capillaries of the hepatic parenchyma, which ensues at the cessation of the afflux of blood on the part of the umbilical vein, and causes an augmented transposition of bile into the blood. If there is a partial or complete closure of the gall duct, at the same time, then the cause is plain. In those cases examined at the Chicago Foundlings' Home, we found such occlusion present, due either to congenital narrowing, partial occlusion from thickening of the mucous membrane, or from viscid or inspissated bile. One cause of the frequency of this disease among foundlings is their exposure to cold air and a vitiated atmosphere—which seriously interfere with the functions of the skin and respiratory organs, and tends to increase the hyperæmia and evident congestion of the intestinal mucous membrane. The infantile mucous membrane, like the skin, it seems to the author from a close study, undergoes a *genuine inflammation*, which if aggravated by cold, bad air, or irritating food, will be almost sure to produce more or less occlusion of the bile duct, and consequently reabsorbtion of bile and the resultant jaundice. Another cause which may explain the rareness of this disease in the Dublin Lying-in-Hospital, is not so much the watchful care as the solvent and bland action of colostrum, which is denied many foundlings. Cases also occur from non-closure of the ductus venosus.

The *pathology* of this form of icterus differs from the simple form in that the icterus is due both to the hematine and bile, and is therefore deeper and more bronze in appearance than in simple jaundice. The sclerotic is of a deep yellow and the mucous membrane is also tinged. If the navel is not healed, there will be a tendency to suppuration at this point. The mucous membrane of the bile duct will be inflamed, while the body of the liver will appear swollen and gorged with blood of a dark liquid character.

Treatment.—If the disease is due to irritating food, this must be changed to a more bland, oily aliment, *e. g.*, diluted cream. (See Food).

Aconite is the remedy usually indicated. Teste justly remarks that "this remedy will often suffice to cure the disease," and this has been the experience of the author. *Bryonia* from the first, or after *Aconite*, if there is vomiting of food soon after taking it. The child cannot bear to be moved especially in sitting it up or elevating its limbs. Skin yellow, thirst, heat in the forehead and palms of the hands.

Chamomilla if there is no fever, child cries with colic, and is very fretful, but is relieved by carrying. Light colored and offensive stools or bilious diarrhœa. Caused from fit of anger in the nurse or from cold.

Nux vomica.—Teste says, "under circumstances nearly analogous to those which call for *Bryonia*, but especially if there is constipation, with hot and dry skin." If the nurse is a high liver or takes much coffee. (Guernsey). Colic, sleeping late in the morning. These are the chief remedies, but Hering adds *Mercurius vivus*, *Sulphur*, *Lachesis*, and *Ipecacuanha* (compare *Bryonia*).

Hartmann gives the result of his experience as follows: "If the difficulty should have a catarrhal origin, *Chamomilla* and *Dulcamara* are the best remedies. They may be given alternately every twelve hours, in minute doses, and their action may be assisted by uniform temperature and tepid baths. It frequently happens that such an icterus is the result of the abuse of certain drugs, such as *Chamomilla* or *Rhubarb*, which ignorant mothers or nurses pour into the infant's bowels for the purpose of expelling the meconium. Then administer suitable antidotes. They may be given at the same time to the infant and mother, to the latter in larger doses. I have frequently cured the disease with *Nux* 12th or 30th attenuation, especially when catarrhal symptoms seemed to be present, or the bowels had been confined beyond the proper period. If spasmodic symptoms had occasionally shown themselves during pregnancy, or even during confinement, or in the infant, *Ignatia*, 12th or 30th attenuation, proved an excellent remedy in my hands. If no improvement had set in after thirty-six or forty-eight hours, I found *China*, 24th attenuation, efficacious. *Ipecacuanha* and *Pulsatilla* might be exhibited, if the tongue should be furred, if the infant should gag and bring up a good deal of phlegm, if there should be a good deal of mucous rattling in the chest, the fæces should be encircled with mucus, etc. If we should feel certain that the excessive use of *Rhubarb* had occasioned the disease, a few doses of *Chamomile*, or if they should not be sufficient, *Mercurius solubilis*, 18th attenuation, will remove the trouble.

In the hands of a prudent and experienced Homœopathic physician, icterus neonatorum will scarcely ever run into the malignant type. This may, however, happen; or the Homœopathic physician may be sent for to take charge of such a case after bungling nurses or Allopathic physicians had exhausted their mischievous powers. It is a satisfaction for me to be able to say that I have never lost one of the many cases of this disorder that I have been called upon to treat, and I will therefore proceed to a description of the means I have used. If the disease should have progressed so far without any previous treatment in either of these cases, the excessive prostration of the little patient pointed to *China*, 12th attenuation, to be followed in many cases by *Mercurius solubilis*, 12th attenuation. This medicine may likewise have to be exhibited previous to the *China*, and is indicated by the following symptoms: Brass color, diarrhœic stools consisting of bloody mucus, with cutting and sometimes with tenesmus, generally worse towards evening and night, painful distention of the abdomen, hectic fever with exhausting sweats, soreness of single parts, etc. *Digitalis* is less indicated in this affection from the commencement, as long as the symptoms of a general constitutional irritation of the organism prevail. *Digitalis* may indeed seem to be indicated, together with *Mercurius*, by a sensitiveness of the region of the liver and pit of the stomach; but the sensitiveness of *Digitalis* is less acute and more circumscribed than that of *Mercurius;* it is more confined to the region of the gall-bladder; the passages pointing to *Digitalis* are likewise different from those of *Mercurius*, they are ashcolored or whitish, and the urine is emitted by fits and starts. Moreover, *Digitalis* has no fever, except a sensitiveness to cold, and the pulse is slow. I have generally exhibited the sixth attenuation in repeated doses. When the disease seemed to be complicated with psora, I have been in the habit of giving a dose of *Sulphur* 30th, repeating it, if necessary, in a few days.

"It is not to be expected that the course of treatment which I have pointed out so far, should be applicable in every case. All that I have desired to accomplish, is to furnish the necessary general indications which may have to be modified in particular cases, and for which I rely upon the judgment of each practitioner. We may perhaps have to select among *Acidum nitricum*, *Hepar sulphuris Calcarea carbonica*, *Tartarus emeticus*, *Veratrum*, *Bryonia*, *Squilla*, *Colocynthis*."

In addition to the foregoing, we give the indications for the following remedies:

Arsenicum.— Undigested, light colored, offensive stools; dry scald head. Child emaciates rapidly.

Calcarea.— Pit of stomach swollen out like a saucer inverted. Indigestion.

China is indicated where there is redness of the tip of the tongue, distension of the abdomen, especially after eating. Stools large and undigested. Tenderness in the region of the liver.

Colocynth when child has much colic, doubles up with writhing and twisting.

Digitalis.— A clear tongue covered with white slime. The stools are almost white; scanty brown urine; frequent and empty retching attended by much debility. Pulse intermittent.

Dulcamara.—The child gets worse at every cool, damp change of the weather. Mucous stools.

Hepar sulphuris calcis for cases that have been dosed with *Mercury*. Dry pimples on the skin.

Ignatia, if inclined to spasms. Frequent sighing or sobbing.

Ipecacuanha, if there is almost constant gagging or nausea.

Mercurius sol.—Tongue large, pale, and covered with a yellow, buff coat; slimy stools. Urine abundant, high colored, staining the diaper and having a strong odor.

Nitric acid.—Constipation. Urine scanty and strong smelling; very restless after midnight. Disposed to hemorrhage from navel.

Podophyllum.—Morning diarrhœa. Prolapse of rectum. Whitish chalk-like stools, very offensive, with frequent gagging and thirst.

Pulsatilla.—Mild, tearful disposition. No appetite, no thirst; vomiting of mucous. Stools very changeable in appearance; worse toward evening.

Sulphur.—The discharges excoriate the anus; inclined to intertrigo and to papular eruptions. The child wakens often.

FATTY INFILTRATION OF THE LIVER.

Symptoms.—When the amount of infiltration is slight and transitory there may be an entire absence of symptoms; and even when they do exist, they seldom present the severity met with in adults. The increase in the size of the liver may be determined by palpation and percussion, and there may be some tenderness of the organ on touch. Disturbance of the digestive organs from obstruction to the portal circulation is not uncommon. There is rarely any jaundice or ascites, so that in well-marked cases there is usually no difficulty in the diagnosis.

Causes.—Fatty infiltration is not always pathological, but is often only physiological and transitory, but in the former case it may be the result of disproportionate and unsuitable food, especially when, as is too often the case amongst poor people, it is too rich in hydro-carbons. It may also accrue from insufficient exercise and from chronic and exhausting disease, as tuberculosis, caries of bone, intestinal catarrh, rickets, syphilis, and many other unknown causes.

Pathology.—In this condition the amount of fat in the hepatic cells is much increased, though the cell-walls remain uninjured. On post-mortem examination the liver is found increased in all its measurements, the surface oily and glistening, the margins rounded, the substance doughy to the touch, and, on section, of a uniform whitish-yellow color, interspersed with brownish-red spots, and on microscopic examination granules and globules of fat are found to abound everywhere.

The *treatment* must depend on the cause, and be in great measure dietetic. The food should be less starchy. (See Foods, p. 296). The choice of remedies will be between *China*, *Arsenicum*, *Natrum mur.*, or *Phosphorus.*

FATTY DEGENERATION AND ATROPHY.

Fatty degeneration of the liver occurs much more rarely in children than fatty infiltration, and it does not always have a definite character, but may differ in accordance with the cause. The glandular parenchyma is its primary and most usual seat, though in its later stage it affects the whole organ, but in some exceptional cases only parts of the gland seem to be attacked.

Causes.—During the course of certain acute febrile diseases, especially the acute exanthemata, such as scarlet fever, small-pox, measles, and typhoid, also pyæmia, fatty degeneration of the liver may occur without any well-marked symptom; or it may be the result of some general exhaustive disease of a tubercular, or rickety character. It may also be found as a part of a general fatty degeneration in newborn children, and in cases of arsenical and phosphorus poisoning.

Steiner has seen fatty degeneration of the liver the result of general parenchymatous hepatitis, with coincident fatty degeneration of the kidneys, heart, and brain, in cases where it seemed to be an independent disease, and inexplicable by our present knowledge of the process. In very severe cases ending fatally he has seen the urine loaded with bile-pigment and the bile-acids, and such symptoms occur as mania, convulsions, tetanic spasm, extravasation of blood under the skin and mucous membranes. The liver was not found softened, but somewhat diminished in size, but neither in it nor in the urine was there leucin or tyrosin, but numerous fat-globules in both. The so-called yellow atrophy of the liver, in which there is abundance of both leucin or tyrosin to be found in the liver and urine, is very seldom met with in childhood.

In both of the two last-mentioned diseases the course is almost always disastrous, and any treatment must be purely symptomatic. The cause should be carefully sought out and antidoted if possible. For *Arsenical* poisoning *Hepar*, *Ipecac*, and *Nux vomica*. For *Phosphorus* poisoning *Nux vomica* also. Following the exanthemata, *Sulphur* or *China* will be needed. If due to tuberculosis *Hepar;* rickets, *Calc. phos.* or *Argentum.*

LARDACEOUS, WAXY, OR AMYLOID DEGENERATION OF THE LIVER.

From the nature of the disease this is much more rarely met with than fatty alteration of the liver, and it is always characterized by a marked increase in size of the organ; in one case, of a boy thirteen years old, it having been found to weigh seven pounds ten ounces. It is always much firmer than normal, the edges are rounded, the color is greyish-yellow, greyish-red, or light brown, and the cut surface is smooth and glistening and covered by a small amount of viscid bile.

On microscopic examination the small blood-vessels and to a greater or less extent, the glandular acini are found to be occupied by a transparent mass, which, when treated with *Iodine* and *Sulphuric acid*, gives a violet or reddish reaction. The amyloid degeneration is seldom limited to the liver, the spleen, kidneys, intestinal mucous membrane and the lymphatic glands, being more or less implicated.

The disease may exist independently, though it is very generally found in association with cachectic conditions and chronic suppuration. Steiner has seen it in children as early as the fifth week of life, but it is most frequently seen in children after the fifth year, and boys seem more subject to it than girls.

The amyloid change in the liver is always chronic in its course. The abdomen becomes distended and the cutaneous veins prominently marked; the gland can readily be mapped out by palpation and percussion; it is hard to the touch, and the surface is smooth with the edge bluntly rounded. In the course of the disease the patient becomes emaciated and spanemic; the appetite is much impaired, with a marked loathing against animal food, and the case is closed by general dropsy and indications of kidney complication.

The treatment can only be general and symptomatic unless the cause of the condition can be ascertained. Good nourishment is of prime importance. If the cause is a drain as from abscess the remedies will be *Hepar*, *Silicea*, *Phos. acid*, *Ars.* If from syphilis *Merc. or Kali.* If from exhaustion *China*, *Carbo veg.* Country air, warm springs, such as Marienbad and Karlsbad, are recommended; and, when dropsy sets in, see *Apis*, *Arsenicum*, *Apocynum*. But the results are not favorable, the disease being almost always fatal.

SYPHILITIC INFLAMMATION OF THE LIVER.

This form of congenital syphilis is not so often met in the country as in the cities. As to the time of its appearance the disease, it is very commonly met with in new-born children and sucklings, but it is rare in more advanced children, and it may affect the liver generally or only in part. In the former case the liver is markedly larger, its tissue is hard, elastic, and glistens like flint (Gubler), and has an abundant increase of the interstitial connective tissue of the parenchyma. In the partial affection of the liver insulated patches of the hard altered tissue are found scattered through the gland, or the new formation occurs as sharply defined nodules of the size of a hazel or walnut, with a firm external layer (syphilitic gummata.) Peri-hepatitis, with proliferation of the connective tissue of Glisson's capsule, especially over the affected parts, is also commonly found.

Symptoms.—This disease does not usually manifest itself before the third week. Severe bilious vomiting is often an early and serious symptom. When the affection is slightly marked a diagnosis is scarcely possible, but when severe, the liver will be found enlarged hard, and by compression of the bile-ducts and of the blood-vessels jaundice will generally be induced. Ecchymosis of the skin and ascites are often also present, and the diagnosis will be completed if indications of syphilis be found on the skin and mucous membranes.

The *prognosis* must generally be unfavorable, and any treatment must be directed against the cachexia. The choice of remedies will lay between *Mercurius* (*cinnabaris* or *Merc. prec. rub.*), *Nitric acid* or *Kali hyd.*

CIRRHOSIS OF THE LIVER.

In a temperate climate this is a very rare disease among children. It consists of a hyperplasia of the interstitial connective tissue, with, in the first stage, increase of size of the organ, followed by diminution. The capsule is generally of a milky opacity, the surface shows numerous slight indentations, and the color of the gland-substance is a bright yellow-brown, but sometimes of a bronze color from infiltration of pigment. The consistence of the gland is firm, its edges obtuse, and a cut surface is brawny and greyish-red, from the numerous trabeculæ of immature connective tissue. In such cases there is usually an enlargement of the spleen, and frequently some other condition, as chronic intestinal catarrh, parenchymatous nephritis, fatty degeneration and hypertrophy of the heart, lobular pneumonia, œdema of the lungs, purulent meningitis, and cerebral œdema.

The *causes* of this disease are not yet known. The cases which have come under Steiner's observation occurred between the sixth and twelfth years, and boys more frequently affected than girls in the proportion of three to one. Weber has found it in a new-born child.

The symptoms, prognosis, and treatment, are the same as in adults. The remedies to select from are *Bryonia*, *Lach.*, *Merc.*, *Nux*, *Natrum m.*, *Carbo v.*, *Puls.*, *China*, *Ars.*, *Sepia*, *Lyc.*, *Mag. m.*, *Chel.*, *Nitric acid*, *Lept.*, *Selen.*, *etc.*

HEPATITIS (INFLAMMATION OF THE LIVER).

Hepatitis may be either acute or chronic. In the latter case it may be entirely overlooked. Many authors imagine that hepatitis is a very rare disease among children, and for this reason make no mention of it in their works, *e. g.*, Meigs and Pepper, Smith and others. It occurs more frequently than other inflammations, for this reason, that the liver plays an important part in the infantile organism, and is frequently involved in the inflammatory condition of the abdominal viscera. The frequency of functional derangements of the liver may be inferred from the discolored, white, gray, greenish passages, which occur every time the children ail, especially when the abdominal functions are out of order. It is my belief that inflammations of the liver are quite frequent among children.

Hepatitis is characterized by loss of appetite, eructations, retching, vomiting after eating, dirty coating of the tongue, flatulence, costiveness or diarrhœa, with altered color of the passages, which are of a white-gray, or of a light-yellow or grass-green color, have an offensive smell; in some cases the food passes off undigested, and in other cases the bowels are bound. Other symptoms are: Languor, depression of spirits, or else a head-strong and peevish mood; the inner hands feel hot and burning, the fever exacerbates in the evening, with small, frequent, contracted pulse, restless sleep and increased thirst; little sweat and dark urine. The region of the liver is somewhat bloated, very hot and the whole sub-costal region very painful; these last symptoms may be overlooked, except when the inflammation is very acute. On percussing the region of the liver, we discover dullness of sound over a large area. The pain frequently extends to the right shoulder, on which account the children complain of pain when they are taken up or turned; the patient is unable to lie on the right side; the right cheek is sometimes flushed, the respiration impeded and anxious.

Gastric fevers especially chronic gastritis, sometimes pass imperceptibly into chronic hepatitis, recognizable by an increased secretion of bile, yellowish, dingy, livid color of the skin, and sensitiveness of the region of the liver.

Hepatitis develops more frequently than many other diseases a state of debility, and the child's life is soon in danger. Among the collateral symptoms we distinguish cough and vomiting, the former with dyspnœa and pleuritic stitches, if the convex portion of the liver should be more affected; the diarrhœa being complicated with other gastric and bilious symptoms, if the concave portion should be the principal seat of the disease. In case of a fatal termination, the strength of the patient fails rapidly, the pulse becomes frequent, intermittent, and tremulous; spasms, convulsions, or even trismus set in, or else the child dies gently as in atrophy. In case of recovery, we have critical cutaneous secretions, copious discharge of a thick, cloudy urine, or critical, bilious diarrhœic stools, with a gradual abatement of all the symptoms.

All these symptoms might lead us to diagnose some other affection of the liver or of some adjoining organ, and the diagnosis is moreover rendered difficult by the fact that the liver is scarcely ever wholly inflamed, and that the symptoms vary considerably according as the convex or concave portion, the right or left lobe of the liver, etc., is inflamed. The younger the child, the longer the liver.

Anatomical Characters.— Post mortem examinations have shown, that in children who die with hepatitis, the liver is enlarged, or partially and totally indurated; at times we find it engorged with blood, and at others softened. On the surface we sometimes observe ecchymoses, and at others a bright redness. In many cases adjoining organs are found to be affected. In new-born infants hepatitis generally is caused by inflammation extending along the umbilical vein, that terminates in suppuration.

Among the causes, teething and weaning are believed to have some connection with hepatitis. It occurs most frequently in early hot summers, which would lead one to believe that then it is an epidemic disease. Colds are likewise frequet causes of hepatitis; it is also said to come from worms, and may be occasioned by bandages, pressing on the region of the liver, by rough handling of the umbilical cord, and by contusions of the hepatic region. Living in damp localities, the abuse of cathartics by nurse, or too dry and highly seasoned food may be prominent causes.

The *prognosis* depends upon the extent and grade of the inflammation, upon the constitution of the patient, complications and terminations. An inflammation of the parenchyma or concave portion of the liver is more dangerous, than an inflammation of the convex portion. Complications with dyscrasia, fever and ague, dysentery, bowel affections are unfavorable; terminations in abscess and other disorganizations are likewise dangerous. Unfavorable symptoms are: Anguish in the præcordial region, obstinate vomiting of a grass-green matter, frequent, small, irregular pulse, delirium. Singultus, or hiccough is supposed to be less dangerous in this disease than in others.

Treatment.—The hepatitis of children requires to be treated somewhat differently from that of full-grown persons, which is generally more acute, and has a variety of causes. The remedy should be carefully selected, for a prompt cure is imperatively demanded. This vital organ cannot be diseased long without jeopardizing the life of the child. The remedies given under icterus should be carefully studied.

Chamomilla (6th to 12th) for green or light yellow stools, or stools which look like stirred eggs, flatulence, white-coated tongue, anxiety, fullness and distention of the region of the liver, increased temperaature in this region, febrile motions with evening exacerbations. There cannot be any doubt that *Chamomilla* has cured a number of acute cases of hepatitis, and that other Homœopathic remedies have cured other acute affections, without the physician having been aware that the disease was really an acute and dangerous malady. Our remedies strike at once at the disease and neutralize it, and this is the reason why Allopathic physicians pretend that we only treat light cases, and that all serious cases are left for them. (Hartmann.)

We agree with Hartmann that in parencymatous hepatitis, with acute fever, it is absolutely necessary to give repeated doses of *Aconite* until the pain seems less, and the sighing, respiration, the tossing about and the anguish have abated or disappeared. Afterwards *Mercurius*, *Pulsatilla*, *Belladonna*, *Nux vomica*, *Bryonia*, *Sulphur*, or some other remedy may be indicated. *Belladonna*, highest attenuation, is probably the best remedy next to *Aconite*, if the fever should continue high, the pain in the shoulder on raising or turning the child should still be the same, and the agonizing tossing about and sleeplessness should denote an invasion of the sentient sphere.

Mercurius solubilis deserves a preference, when the stools are of a white-gray, dark green or bilious color, the skin and eyes have a bilious tint, and the patient has frequent chills. Sometimes *Belladonna* and *Mercurius* seem to be indicated together; in such a case *Belladonna* should be given first, and in four or six hours *Mercurius*, and so on alternately.

All these medicines will likewise do for milder cases, to which we may add *Pulsatilla* (12th to 30th., H.) This remedy seems to suit children with a childlike, mild and gentle disposition, pale face, blonde hair and blue eyes, and may effect a cure if the inflammation should have developed itself out of a gastric derangement, caused by eating something which did not agree with the child. It is particularly indicated by a peevish, obstinate mood, languor and depression of spirits, tenacious and yellowish coating of the tongue, bad taste, loss of appetite, greenish, slimy diarrhœic stools, tension and sensitiveness of the epigastric region, with frequent paroxysms of anguish at night, chills in the daytime.

If diarrhœic stools should alternate with constipation, flushes of heat with chills, if the chills should be induced by every motion of the body, and the pains should then be worse, attended with anxious and oppressed breathing; *Bryonia* (18th to 30th attenuation, H.) will have to be given. If, however, constipation should be the prevailing symptom, with jaundiced color of the skin, vomiting of bilious matter, excessive sensitiveness of the region of the liver to contact, *Nux vomica* deserves a preference.

Sulphur has not proved very efficacious in Hartmann's hands, except in cases where the other medicines only effected a partial improvement, after which the disease seemed to remain stationary, or where the above-mentioned remedies had no effect whatever; in such cases a dose of *Sulphur* seemed to act like a charm, and frequently was all that was required for a cure.

Among the remedies for acute hepatitis, Hempel thinks, *Arsenicum* should not be forgotten. Its chief indications are: Deep-seated, agonizing pain at one spot in the region of the liver, the patient is unable to lie down, has to be in a sitting posture, bent double, and the limbs are in constant motion; constant moaning and sobbing, hurried pulse and respiration, nausea or vomiting, agony, sallow complexion, expression of anguish in the features, burning heat of the skin, thick, slimy, brownish or blackish coating of the tongue, constipation or else discharges of black, fœtid matter, intense thirst, parched lips; or the pain in the region of the liver may be less violent, with cramps in the upper extremities, agonizing anguish, cold sweat after the cramp, thirst, sallow complexion, headache, the patient complains of seeing frightful things or vermin, has dreadful forebodings, etc. *Arsenicum* is particularly suitable when the inflammation has a typhoid form.

There may occur cases where the physician may have to select among the following remedies: *China*, *Digitalis*, *Calcarea*, *Lachesis*, perhaps also *Lycopodium* and *Natrum muriaticum.*

Lachesis may be needed where *Mercurius* or *Belladonna* are indicated, but do not seem efficient. Worse after sleeping.

Lycopodium.— Red sand on the diaper. Flatulence on left side; constipation, chronic cases.

Natrum mur.— From abuse of *Quinine.* Vomits food smelling like old cheese.

THE PANCREAS AND ITS DISEASES.

This gland has been overlooked by all the writers on Diseases of Infants and Children consulted. This is due, without doubt, to the obscurity of its function and diseases. All the glands are but complements of each other. The chief function of this gland seems to be to emulsify the albuminates, as the following experiments prove.

Experiment 1. March 4, 8 P. M. Pancreas from child two weeks old, that, died at the Chicago Foundling's Home of enteritis. The pancreas twenty-four hours after death, is quite pale in color. Macerated it to a pulp and added an equal quantity of warm water to which was added one-third of a drachm of milk. After standing two hours the white appearance of the milk had faded into a pale watery emulsion. In the morning the lower part was watery, while the upper portion was covered with the oily cream. In two days the cork of the vial was thrown violently out with considerable of the contents. There was the odor of decomposition. At the bottom of the vial was a pale emulsion, while the cream on the surface was rancid.

Experiment 2. March 1879. Pancreas from a large infant one week old that died of cerebral congestion. Took out pancreas forty-eight hours after death. It was of a light pink color, and somewhat larger than specimen No. 1 The size of the infant pancreas is about two to two and one-half inches in length, by one-fourth inch in thickness. There is a more uniform development than in the pancreas of the adult. This specimen was treated as was No. 1. Macerated in one-third drachms of water and as much milk (twelve hours old) added. The vial was then brought to the heat of the body by immersing it in warm water. In two hours the milky appearance had faded but not so much as in No. 1. In the morning a thick cream was upon the surface. In three days this was oily and the contents were not decomposed as in No. 1, but a fine emulsion filled the lower part of the vial.

It is found that the pancreas is not able to digest starch, *i. e.*, transform it into sugar, till after six months. (Sansoni.) Its proper place will be better understood if we remember that the acid gastric juice swells and dissolves the fibrinous (caseous) envelope of the milk. This work is also aided by the sugar being transformed into lactic acid. Then as the current reaches the alkaline stream (bile and pancreatic juice) it is further digested by the bile attacking the fat while the pancreatic juice attacks the swollen casein and free albumen and emulsify them so that as the fat is broken up into globules, there is plenty of albumenates (dissolved casein) to envelope them, thus rendering them small and mobile for lacteal absorption. Understanding now its chief function, we can better ascertain its derangements. When the stools are fatty, shreddy and offensive, we may infer that the pancreas is at fault. In such cases the pancreatic emulsion (made by mincing and macerating a pancreas of a calf or pig in twice its bulk of warm water for an hour and given in teaspoonful doses), has afforded prompt relief. Its effect will help in diagnosis and also aid in selecting the true remedy in pancreatic disease.

ANATOMY OF THE PANCREAS.

The *development* of the pancreas takes place very early from the posterior wall of the duodenum in the form of a saccule or bud.

The pancreas in the infant at birth is a long, narrow, acinous gland, about two inches long and a quarter of an inch in diameter, and lies crossways behind the stomach and left lobe of the liver. It can be exposed in its entire length by cutting through the gastro-colic omentum, parallel with the lower border of the stomach, and by drawing the stomach upward, and the transverse colon downward. The pancreas will now be seen at the bottom of the sac of the omentum (Bursa omentalis) covered by peritoneum (ascending layer of the transverse meso-colon.) The middle portion of the gland (the body) lessens toward the tail, which reaches as far as the highlum of the spleen, with which, as also the kidney and supra-renal capsule, it is connected with loose areolar tissue; towards its right extremity (the head) the gland increases in size, especially in an upward and in a downward direction so that the entire organ has in some measure, the appearance of a hammer. The ascending portion of the head lies in the concavity of the duodenum and is connected with the ascending and descending portions by means of dense areolar tissue. The descending portion, the so-called pancreas parvum, inclines backward and outward, and sometimes even forms an almost complete ring around the duodenum.

The posterior surface of the pancreas lies on a level with the first lumbar vertebra, on the pars lumbalis (pillars) of the diaphragm. Its anterior surface is covered with peritoneum (the posterior layer of the lesser omentum.) With its lower border it covers the commencement.

of the superior mesenteric artery and the termination of its accompanying vein and across its upper border is the cœliac axis, so that the pancreas runs between the cœliac axis and the origin of the superior mesenteric artery. A shallow groove along its upper border serves for the splenic artery and vein, the former running in a very tortuous course from right to left. (Ziemssen.)

The structure of the pancreas closely resembles that of the salivary glands, for it consists of racemose clusters of secreting follicles, which form the terminations of the ramifying divisions of the duct; each cluster, with its blood-vessels, lymphatics, nerves, and connecting tissue, forming a lobule; and the separate lobules being held together by areolar tissue as well as by the vessels and ducts. The cells of the secreting part of the gland are, according to Latschenberger, large, and contain a succulent mass of protoplasm in their interior. If the gland be injected from the duct of Wirsung, a dendritic series of branches are brought into view, which has led various observers to believe that the secretory cells of the pancreas like those of the liver, are surrounded by extremely fine ducts, which convey the secretion into the large excretory passages, but Latschenberger has shown that there are no such independent tubes, the appearance being due to the injection forcing its way not only into the axis of the canal, but through the interspaces between the adjoining cells. (Carpenter.)

It is transversed in its longitudinal diameter by its main excretory duct, which receives, as it passes from left to right, the lateral branches coming from the glandular lobules, and finally, opens into the cavity of the duodenum, closely adjacent to the situation of the common biliary duct, at about ten centimetres below the pyloric orifice of the stomach. Its secretion thus enters the intestine and mingles with the substances undergoing digestion, almost immediately after they have passed from the stomach into the duodenum. There is often a smaller accessory duct opening into the intestine, sometimes below the situation of the principle one. (Dalton.)

The principal excretory duct called the canal of Wirsung is about as large as a probe in the infant and a goose-quill in the adult, and is lined with columnar epithelium. It commences by the union of five branches at the tail end, and runs from left to right through the entire length of the gland, nearer the posterior than the anterior surface. The comparatively small branches of the individual lobes unite at acute angles with the principal duct. (Friederich.)

Like both the liver and the salivary glands the development of the pancreas commences by a sort of budding forth of the alimentary canal at a particular spot upon which a mass of cells has previously accumulated. (Carpenter.)

ANOMALIES.

Anomalies of Position.—The pancreas together with other organs has constituted the contents of an umbilical or diaphragmatic hernia and after traumatic rupture of the diaphragm been displaced along with the stomach, colon, omentum, or spleen, into the thoracic cavity.

Congenital Anomalies.—A rarely occurring organ, identical in structure with the pancreas, lying between the coats of the intestine has been described as an accessory pancreas. The size of the accessory pancreas is always considerably smaller than that of the pancreas proper and varies from that of a silver quarter of a dollar, down to that of a pea. On section the lobulated, glandular structure is easily recognized, but the acini are smaller than those of the chief organ. These accessory structures are almost invariably smooth, flattened in shape, and correspond histologically with the gland proper. As a rule, perhaps always, they are provided with an excretory duct, which terminates on a small papilla in the mucous membrane, and empties itself into the duodenum. The accessory pancreas is always found between the intestinal coats, having its seat sometimes in the serosa, sometimes in the submucosa, or even partially in the musculosa, in which cases muscular fibers are found running between the acini.

Hyrtl has twice observed and described a pancreas divisum. The pancreas was divided into two portions, which were connected together only by the branches of Wirsung's duct. In one case the separation corresponded accurately with the point at which the left gastro-epiploic artery crosses the pancreas, and in the other with the point where the superior mesenteric artery passes down behind it. (Ziemssen.)

Rokitansky states that an accessory spleen is not unfrequently embedded in the head of the pancreas, and Klob has observed the occurrence of a dark-red accessory spleen, as large as a bean, in the enlarged tail end of a pancreas.

FUNCTIONS OF THE PANCREAS.

The secretion of this gland resembles saliva in its general appearance, being clear and colorless, free from smell, alkaline in its reaction, and very viscid; the only morphological constituents it contains are numerous granules of oil. Upon the application of heat, or upon the addition of any of the stronger mineral acids, it coagulates into a solid mass like the white of an egg. Leucin and xanthin have occasionally been found in the secretion. (Carpenter). The inorganic constituents of the pancreatic juice obtained by incineration amounting to 0.2—0.75 and 0.9 per cent., are lime-earths, magnesia and soda, chlorides of sodium and calcium, phosphates of sodium, calcium and magnesium, sulphates of the alkalies, and traces of iron combined with phosphoric acid. (Frey). The power of the pancreatic juice, as proved by Eberle, of quickly converting starch into sugar exceeds that of the salivary glands, nor is its action further down the intestine in any way interfered with by the admixture, either of bile or of gastric juice. It was discovered by Prospero Sonsino and Korowin and recently confirmed by Zweifel, that the pancreatic juice possesses absolutely no sugar-forming power over starch during infancy; and that this power is not acquired until after the earlier months of life; and that it is not perfectly developed until towards the close of the first year.

The second function of the pancreatic juice is to emulsify neutral fat and so facilitate its absorption by the lymph glands of the intestine. Herbst, however, has showed by experiment that even after ligature of the pancreatic duct, neutral fats till found its way into the lymph vessels in not inconsiderable quantities, thus proving that the pancreas, although the most important, was not the only means of promoting fat absorption as taught by Claude Bernard. Bile also possesses the power of emulsifying fat and aiding in its absorption. Lenz, Bidder, and Schmidt have proved by experiment that during the absence of bile from the intestine, the amount of fat absorbed is less in quantity, and Steiner has shown that the intestinal juices also emulsify fat and make it absorbable. The peristaltic action of the intestine must be considered as an important factor in the production of a permanent emulsion and of its absorption.

Now although the larger quantity of fat taken in with our nourishment is absorbed in a highly divided but yet otherwise unaltered condition, as was first shown by Claude Bernard, a smaller portion of it is converted by the pancreatic juice into fatty acids and glycerine, and this would seem to be a special function of the pancreas, and one peculiar to it. This process is not interfered with by mixture with the gastric juice, since even in presence of abundance of gastric juice, a considerable quantity of free fatty acids has been found after eating fat, both in the large and small intestines, as well as in the feces. The fatty acids, however, for the most part re-combine in the intestine and form with the alkaline salts of the bile and also of the pancreas itself, and of the intestinal juices, soapy compounds, which; by their presence materially assist the emulsifying action of the pancreatic juice. What further role these soaps play in the blood, after absorption by the radicles of the vena portæ and lacteals is not yet settled. They may either be directly oxidized in the blood or the fatty acids may again be set free, and by combination with glycerine be converted into fat, either to be burnt off in this form or to be stored up in the tissues for future use.

In virtue of its third function — that of digesting albuminous compounds, the pancreas must be looked upon as an accessory organ to the stomach thus far, that the peptonizing of such parts of the albuminous bodies as has not been completed by the gastric juice, devolves on it. The co-operation of free acid is not necessary; on the contrary, the peptonizing pancreatic ferment seems to lose its digestive power in the presence of any large amount of acids. The gastric juice has no disturbing effect, because all its free acid is at once neutralized and the pepsin precipitated by the bile. By the continued action of the pancreatic secretion the peptones are again broken up, chiefly into leucine and tyrosine; these are at last voided as fecal matters, which are the ultimate products of the prolonged action of the pancreatic juice.

When fresh pancreatic juice is clear and colorless it contains fifteen to twenty per cent. of solid constituents, and when exposed to the air, deposits a jelly-like clot; it is strongly alkaline in its reaction; its chief constituent is albumen; besides this there is potassium albuminate and certain quantities of those three peculiar organic ferments — sugar producing, peptonizing, and fat destroying — of which however only the first two have been definitely isolated. The leucin found abundantly in the fresh secretion would seem to be formed by the action of the peptonizing ferment on the protoplasma of the secreting cells. At all events it must be admitted that the leucine found in the intestine is only partly the result of the decomposition of the protean bodies taken in as food.

Congenital Diseases of the Pancreas.— Rokitansky found induration of the pancreas in a new-born child; Cruveilhier in a fœtus; Schoeller describes a cartilaginous induration of the pancreas in a female child nineteen days old, who had died of phlebitis hepatica; Claessen relates five cases of pancreatic disease in new-born children and Ziemssen describes syphilitic degeneration of this organ in a seven months' fœtus, born dead.

DERANGEMENTS OF THE PANCREAS.

Disorders of the pancreas together with its functional disorders and modifications are at present but little understood. The obvious reason for this is, that the pancreas does not possess singly and solely any one special function, but rather shares them with many others of the digestive organs. Thus it shares its saccharifying power with the saliva, perhaps also with the secretion from Bruner's glands, its peptonizing properties with the gastric juice and succus entericus, and its power of emulsifying neutral fats with the bile; while its power of breaking up fats into fatty acids and glycerine is the only one which as far as our knowledge of to-day goes, can be said to be peculiar to the pancreas. At one time, emaciation of the whole body, beginning early and proceeding to an unusual degree was thought to be due to pancreatic disease, but too much importance must not be attributed to this symptom, since the same degree of emaciation not unfrequently accompanies various organic diseases of others of the digestive organs, where the pancreas is quite intact, such as the stomach, duodenum, liver, etc., and we must not forget, further, that disease of the pancreas may be complicated with organic changes, such as obstruction of the pylorus, or duodenam, or gall-duct, which would of itself be sufficient to account for even a high degree of general marasmus. It would seem that the greatest emaciation is found in those cases in which, together with disease of the pancreas, the function of the liver or a flow of bile is interfered with; or where the disease mechanically interferes with the general nutrition, either by compressing the pylorus or the duodenum or thoracic duct; or lastly, where the disease itself is such that in any other place or organ, a high degree of marasmus would result. A second symptom has been mentioned, viz., a flow of saliva-like fluid from the mouth, either as eructations or by frequent spitting. This was at one time considered as a hypersecretion from the salivary glands—the expression of an especial sympathy between these glands and the pancreas; at another time this fluid was considered as an access of pancreatic fluid, but the observations are few and have no foundation to base the theory that a consensual, sympathetic or vicarious relationship existed between the pancreas and the salivary glands. It has been shown by Frerichs that in these cases the watery vomiting which occurs in the early morning is due to the large quantities of saliva which have been secreted and swallowed during the night.

A thin, viscid, and constant diarrhœa spoken of as "Diarrhœa pancreatica," "Fluxus cœliacus," "Fluxus pancreaticus" has been considered as symptomatic of pancreatic disease, but this must be also doubted. The presence of fat in the stools, however, is a symptom of much greater diagnostic importance. There is a relation between this symptom and induration of the pancreas as first pointed out by Kuntzman. Moyse attributes an almost pathognomonic importance to this symptom and supports Bernard's doctrine that the pancreas is the only fat-digesting organ in the body. Many other observers have collected statistics showing the presence of fat in the stools where there was pancreatic disease.

The appearance and the amount of fat so passed has been variously described by different authors. At one time it has appeared in small lumps, (*Phos.*), pale yellow or whitish in color and varying from a pea to a nut in size, soluble in *Ether*, and easily melted and burned if thrown into the fire. At another time when the fæces had cooled, it had formed a thick cake around the edges of the containing vessel or more or less completely smeared the surface of the masses of fæces or even swam in a fluid, oleaginous condition on the surface of the liquid fæces. In many of the cases it was stated that the fat appeared with scarcely any fæcal admixture, to have flowed from the rectum like oil (stearrhœa). Sometimes the stools consisted entirely of fat—partly amorphous, tallow-like lumps, and partly crystalline.

In estimating the value of fatty stools as diagnostic of disease of the pancreas, we must carefully remember that healthy human fæces contain a certain amount of fat after the ingestion of a rich, fat diet, as also after the use of castor or cod liver oils, for it appears that the secretions of the liver and pancreas although normal in quantity and quality, do not always suffice to render digestible any unusual amount of fat, so that these fatty stools can only be looked upon as a pathological condition, provided that they occur without there having been any unusual or large indigestion of fat.

In connection with this there may be mentioned cases of pancreas disease, in which either with or without fatty stools, fat was passed along with the urine, and the possible occurrence of lipuria in diseases of the pancreas is well worthy of further investigation.

Fles has drawn attention to the presence of large quantities of undigested striped muscular fibres (or casein) in the fæcal discharge as a symptom of disease of the pancreas. The patient who was diabetic, was in the habit of eating a great deal of bacon and fat meat, and passed such quantities of fat with the stools that it could be scraped off the fæces by ounces. The fæces also contained very large quantities of unaltered, striped muscular fibres. They soon disappeared as did also the fat, after the patient added a calve's pancreas daily to this same kind of food. The experiment was made several times with a similar result. At the necropsy the pancreas was found so atrophied that little else than connective tissue remained, and no traces whatever of the duct could be discovered. It would seem that in the absence of the pancreatic juice and its peptonizing properties, such muscular fibres as escape the action of the gastric juice may circulate through the intestine in large quantities and pass away with the fæces.

A fact of great importance is the by no means rare combination of pancreas disease and diabetes mellitus. Autopsies in such cases have shown the pancreas to be changed into a hard, lumpy, knotty mass or atrophied, or in a state of fatty degeneration, and in many instances to have contained great numbers of prickly white calculi in its main duct and ramifying branches.

Another very frequent symptom is various pancreas affections in chronic jaundice, with all its usual sequelæ. It is sometimes due to the presence of complications, which bring about changes in the liver, but more frequently to the mechanical compression of the ductus choledochus by the enlarged head of the pancreas, and must be thus classed as simple stenotic jaundice. The intimate topographical relations which exist between the ductus choledochus and the head of the pancreas, are such as to predispose to the jaundice which exists in those forms of pancreas disease which lead to enlargement of the gland, and especially in their latter stages.

Enlargement of the head of the pancreas may produce stenosis and closure of important neighboring blood vessels and cases are recorded in which there has been serious pressure upon the vena portæ to such a degree as to suggest cirrhosis of the liver; there has also been compression of the aorta and the inferior vena cava, aneurism of the aorta and obliteration of the superior mesenteric artery and vein and of the splenic vein. (Ziemssen).

ATROPHY.

Atrophy of the pancreas sometimes accompanies chronic cachexia and marasmus of various kinds. The atrophy may proceed so far that the gland substance proper may entirely disappear leaving only a tough flaccid, cord-like piece of connective tissue in its place. Sometimes the lining epithelium of the atrophying gland is in a state of fatty degeneration, in which cases the acini of the still existing portions appear of a yellowish color.

The treatment in this form of disease should be preventive. In child life waste is so great and growth so rapid that the digestive disorders should secure prompt attention. *Phosphorus* may help.

PANCREATITIS.

This may be either acute or chronic, although it is generally admitted that the former is very rare, so much so, that it is even denied by some, but *post mortems* show that it has taken place. It is impossible to make a positive diagnosis of this form. Chronic pancreatitis exist as an interstitial inflammation consisting of a hyperplasia of its inter-acinous connective tissues and consequent atrophy, even to the entire disappearance of the gland substance proper. This process has its analogue in cirrhosis of other glandular organs, such as the liver, kidneys, etc. Sometimes during the stage of contraction, there is a closure of a smaller branch of the excretory duct, and so a secondary formation of cysts. The disease sometimes attacks the entire gland, but with especial predilection the head; sometimes only certain portions of it, or it may show itself in the form of circumscribed, firm cicatricial bands and nodules.

Primary chronic interstitial pancreatitis, affecting the whole gland is extremely rare. The secondary forms, however, are more common, and result, not unfrequently from long continued venous gorging, as in chronic heart, lung, and liver diseases. In these cases the changes scarcely ever attain such a degree as to produce complete cirrhosis, with destruction of the glandular elements; but we find in varying degrees, tracts of connective tissue, spreading in between the acini, and by their contraction giving to the gland a greater toughness, hardness, and a more granular appearance. Klob on cutting into these tracts of thickened connective tissue, found here and there small white spots from which little masses or molecules of chalk, sometimes fat crystals could be squeezed. Sometimes in the hyperæmic forms small interstitial hæmorrhages are found, which become changed later on into masses of rust-colored pigment, or which form spaces containing a serous fluid, and bounded by hardened, rust-colored walls (apoplectic hæmorrhagic cysts.)

With these cases produced by congestion must be classed also those in which the interstitial connective tissue growth and atrophy are due to retention of the secretion through closure of the canal of Wirsung, with subsequent dilatation of the gland ducts. In the latest stages of these cases the organ consists chiefly of connective tissue in which here and there the remains of the glandular structure can be recognized as small granules, yellowish in color, owing to their cells undergoing fatty degeneration. On section the organ is found to be studded with cystoid spaces and beaded canals — the enlarged and dilated excretory ducts filled with the retained secretion (Ranula pancreatica.) The causes of the retention of the secretion may be of varied nature; among others calculi, which stick in the canal of Wirsung or in the ductus choledochus, peri-pancreatic swellings and adhesions, pressure from neighboring tumors or diseases situated in the pancreas itself, especially in its head part and the like.

More frequent than a general pancreatitis are the forms of localized chronic inflammation, the result of the extension of inflammatory changes in some of the neighboring organs, such as gastritis, peritonitis, retro-peritonitis, affections of the lumbar vertebræ. In other cases it is the pressure of a neighboring tumor or of an aneurism of the abdominal aorta, or of the cœliac axis or calculi in the ductus choledochus at the point where it passes by, sometimes through the head of the pancreas; or it may be neighboring ulcers and ulcerative new growths which set up chronic irritation in that part of the gland which lies nearest to it, and so lead to localized indurative changes. Especially worthy of mention are the cases due to constitutional syphilis. Our knowledge of syphilis of the pancreas is decidedly sparse, owing to its great rarity, but nevertheless we know that sometimes the entire gland, sometimes only portions of it may be the seat of the disease; in these latter cases a local cicatricial mass, either with or without gummata, may be found. In newly born children and in the fœtus unmistakable evidence of degeneration of the pancreas in connection with hereditary syphilis has been frequently demonstrated. Birch, Hushfeld records thirteen instances in twenty-five cases, and other pathologists have also observed it.

Symptomatology.—It is utterly impossible to give anything like a summary of the symptoms which characterize the various forms of chronic pancreatitis. Chronic disease spreading idiopathically through the whole gland, in the majority of cases, either remains latent or fails to give rise to any symptoms characteristic of its presence. There is frequently an absence of all distinctive symptoms, and it is only in part of the cases that even single symptoms of pancreas disease—fatty stools for instance—are met with. The presence, however, of fatty stools, possibly intercurrent mellituria, epigastric pain (?) especially and appreciable and deeply seated swelling crosswise in the epigastrium would be the symptoms on which the diagnosis of a chronic inflammatory disease of the pancreas could be in some measure justifiably founded. (Ziemssen.)

Treatment.—This is necessarily meagre in detail. Rademacher states that its "organ remedy" is *Iodine*. *Mercurius* and *Iris* may also be indicated. (Hughes.) The stool symptoms must decide. (See Indigestion, Diarrhœa, Food, etc.)

GENERAL THERAPEUTIC HINTS.

Catarrh of the pancreatic duct. Consult *Belladonna*, *Calc. c.*, *Merc.*, *Puls.* The concomitants must decide the choice.

Where the catarrh extends into the biliary ducts with more or less icterus, *Bell.*, *Merc.*, and in severe cases *Digit.*, followed by *Aur.* Inflammation of pancreas compare *Bell.*, *Con.*, *Hepar*, *Merc.*

Calcarea is a prominent remedy, and Buchner makes the following distinctions: *Calc. acet.* for erythematous persons or skin affections; *Calc. ars.* in collapse, in cardiac and renal diseases; *Calc. carb.* for lymphatic and chlorotic; *Calc. iod.* for scrofulous; *Calc. phos.* for tuberculous; *Calc. oxal.* for melanotic.

The malignant or epidemic form requires *Rhus*, *Calc. ars.*; softening and gangrene of the parts *Kreasote* or *Secale;* suppuration points to *Calc.*, *Hepar*, *Sil.* Hypertrophy of the pancreas yields to calcareous preparations.

Pancreatic Stones.—Bell. or the *salts of calcium*, *Kalium Iodum;* cancer, *Phos.*, *Sil.*, *Calc. ars.*

Without doubt many cases of disease of the pancreas has been cured by our remedies selected by their general, rather than their local symptoms. The food is more difficult to select in a general way. One that is easily assimilated should be sought for. In a young child whey with a little cream, or in an older child one of the dextrine foods, (See Foods), may suit the best. The quantity should be less than normal. Inunction with almond oil may be resorted to, so as to relieve the weakened digestive organs. Food rich in casein like cow's milk, or milk with small globules should be especially avioded. If a fresh calf's or pig's pancreas can be obtained or a fresh specimen of pancreatic emulsion these may be used in the food until the diseased organ is able to resume its normal functions.

DISEASES OF THE SPLEEN.

The numerous glandular organs are all concerned in the process of sanginification. They essentially belong, therefore, to one system and will, doubtless, some day be so regarded. During recent years much progress has been made in the physiological investigations of the functions of all of the glands of the body and particularly of the spleen.

This organ is doubtless more often diseased in infancy than has been recorded. So intimate are its relations, as we shall see, to the lymphatic system—the most active and most often deranged of any in the body—that it must be frequently diseased, and especially in damp localities where there are frequent changes in the weather. Its direct connection with the liver by the splenic vein, the largest branch of the portal system, would lead us to suspect derangement of one when the other becomes affected. Intermittents or splenic fever cannot exist long before the liver becomes deranged, from the diminished flow of blood from the splenic vein. In children where the circulation is so rapid and the blood current so variable, the effect of one organ diseased, upon those organs of other parts of the body should be kept constantly in mind.

ANATOMY OF THE SPLEEN.

The spleen in the new-born is in about the same proportion to the entire body, as it is observed in the adult, being as 1 to 350, but is afterward subject to extreme variations, both in size and weight.

The spleen is one of those glands that possesses no excretory duct. It is of an oblong flattened form, soft, of very brittle consistence, highly vascular, of a dark bluish-red color and situated in the left hypochondriac region, embracing the cardiac end of the stomach. It is invested by peritoneum, and connected with the stomach by the gastro-splenic omentum. The external surface is convex, smooth, and in relation with the under side of the diaphragm, which separates it from the ninth, tenth and eleventh ribs of the left side. The internal surface is slightly concave and divided by a vertical fissure, the hilum, into an anterior or larger and a posterior or smaller portion. The hilum is pierced by several large irregular apertures for the entrance and exit of vessels and nerves. At the margins of the hilum the two layers of peritoneum are reflected from the surface of the spleen on to the cardiac end of the stomach, forming the gastro-splenic omentum, which contains between its layers the spleenic vessels and nerves, and the vasa-brevia. The spleen is held in its position by two folds of peritoneum, one, the gastro-splenic omentum connects it with the stomach; and the other, the suspensory ligament, with the under surface of the diaphragm.

A fibrous elastic coat forms the frame-work of the spleen. It invests the exterior of the organ and the hilum is reflected inward upon the vessels in the form of vaginæ or sheaths. From these sheaths as well as from the inner surface of the fibro-elastic coat, numerous, small fibrous bands, *trabeculæ*, are given off in all directions; these uniting constitute the areolar framework of the spleen. The proper coat, the sheaths of the vessels and the trabeculæ consist of a dense mesh of white and yellow elastic fibrous tissues, the latter considerably predominating. It is owing to the presence of this tissue, that the spleen possesses a considerable amount of elasticity to allow of the very considerable variations in size that it presents under certain circumstances. The proper substance of the spleen occupies the interspaces of the areolar framework of the organ; it is a soft pulpy mass of a dark reddish-brown color, consisting of colorless and colored elements, such as granular matter, neuclei, neucleated vesicles, red blood globules, deep red yellowish or black corpuscles and crystals, all of which are diffused throughout the pulp substance.

There are in addition, a number of small, semi-opaque bodies of gelatinous consistence, disseminated throughout its substance; these are the splenic or Malpighian corpuscles. They are of a spherical or ovoid form, vary considerably in size and number, and are of a semi-opaque or whitish color. They are appended to the sheaths of the smaller arteries and their branches, presenting a resemblance to the buds of the moss rose. Each consists of a homogeneous membranous capsule, composed of fine pale fibres, which interlace in all directions. The blood vessels ramifying on the surface of the corpuscles, consist of the ramifications of the arteries to which the sacculus is connected; and also of a delicate capillary plexus, similar to that surrounding the vesicles of other glands. It is probable that, from the blood contained in the capillary network. The material is separated which is occasionally stored up in the cavity of the corpuscles; the veins being so placed as to carry off under certain conditions, those contents to be discharged again into the circulation. Each capsule contains a soft, white, semi-fluid substance consisting of granular matter neuclei similar to those found in the pulp, and a few neucleated cells, the composition of which is apparently albuminous. These bodies are the largest after digestion is completed. (Gray.)

Development.— The origin of the spleen, as far as at present known, is from a special aggregation of cells belonging to the middle germinal plate, and quite unconnected with the digestive organs. These cells are subsequently metamorphosed into the various tissues of which the organ is composed. The first rudiments are remarked at the end of the second month. According to Remak the appearance of the Malpighan corpuscles is very early, but Kolliker believes that it is only towards the end of intra-uterine life that they are formed.

Anomaly of the Spleen.— Steiner found in a child two years old, suffering from follicular enteritis and broncho-pneumonia, that the spleen was movable, and could sometimes be felt low down in the left abdominal region between the pubis and umbilicus, and that, if replaced in its usual position, it would not remain long there. Slight pain was induced by its replacement, but otherwise it gave rise to no symptom.

Functions of the Spleen.— Carpenter in speaking of the function of the spleen and thymus and thyroid glands, makes the following summary.

The results of all recent investigations on these ductless or vascular glands tend to prove that equally with the absorbent (lymphatic) glands, they supply the germs of those cells which are ultimately to become blood corpuscles. Such, it is well known, was the doctrine of Hewson in regard to the spleen and thymus gland; and there are many facts which lend it a considerable probability.

In the first place there is no difficulty whatever in the admission of such corpuscles into the smaller veins of the spleen, if the account of its lacunar circulation be correct. That there is no physical impossibility in the reception of particles of such size into the interior of even a closed system of capillaries is proved by the curious facts noticed, (Carpenter, p. 200) in regard to the passage of starch grains into the mesenteric veins.

Secondly, there is an unusual proportion of colorless corpuscles in the blood of the splenic vein, so that while according to Hirb the proportion of colorless to colored corpuscles in the blood of the splenic artery is as 1 to 2000; in that of the splenic vein it rises to 1 to 70, and in some diseased conditions it has been known to amount to 1 to 4.

Thirdly, if the spleen be extirpated, which has been performed on man himself, showing that its functions are not indispensable for the preservation of life, the only effects observed have been increased in volume and pigmentation of the lymphatic glands, probably in consequence of their taking on a vicarious action in the development of the white corpuscles.

Fourthly, the period of greatest functional activity of these glands generally, is during the period of early childhood, when the formative processes are going on with extraordinary activity; and there is at the time a larger proportion of colorless corpuscles in the blood than at any subsequent time, at least in the healthy state. Further, as Prof. J. H. Bennet has pointed out, that peculiar condition of the blood, which consists in the multiplication of its colorless corpuscles, is almost always associated with hypertrophy of one or other of these bodies; and in one case of this kind, in which the thyroid was the organ affected, its cells and their included nuclei were observed to be considerably smaller than usual, and the same peculiarity presented itself in the colorless corpuscles of the blood. Hence there seems a strong probability that while the plasma of the blood is being elaborated by these bodies, a constant supply of new blood corpuscles is also afforded by them; and that they thus effect for the nutrient materials directly absorbed into the sanguiferous system, that which the glandulæ in connection with the absorbent (lymphatic) system accomplish for the substances which it has taken up, *i. e.*, the fat.

This would go to prove that the vascular glands complete the work began by the digestive system and which is continued on a step higher by the lymphatic system. This being so, we have a chain of evidence, in looking up the effect of derangement of one system upon the functional activity of the others.

ENLARGEMENTS OF THE SPLEEN.

The spleen in children and its diseases have received very little attention, less by far, than their importance merits.

Acute Enlargement.—This is met with in typhoid and intermittent fevers, and also generally in acute diseases, such as scarlet fever, small-pox, diphtheria, purpura, pyæmia, etc.; also in local inflammatory processes, especially in croup, pneumonia, interstitial and parenchymatous hepatitis, erysipelas, etc. The enlargement is uniform, never reaches to the size seen in the chronic enlargement, and the capsule of the gland is stretched, wrinkling as the swelling disappears. The tissue is hyperæmic, friable and pultaceous.

Chronic Enlargement.—This may be due to simple hyperplasia of all the elements, or to some additional alteration in texture, the latter being especially frequent in the form of amyloid and lardaceous degeneration. The increase in size is sometimes very considerable, the enlarged spleen occupying as much of the abdominal cavity, and presenting a smooth, firm surface, anæmic or pigmented and in the case of amyloid degeneration the cut surface presents a glistening waxy appearance. The most important predisposing causes of splenic enlargement are rickets, chronic intestinal catarrh (forty-two out of a hundred being due to this disease), tuberculosis, scrofula, caries, disease of the heart and syphilis. (Steiner.)

Diagnosis.—It is not as easy to detect an enlargement of the spleen in a child as in the adult, because children up to the third year, are generally much averse to a protracted examination of the splenic region. It is best to examine them in the dorsal or right lateral decubitus. In the examination of the spleen by percussion, very gentle blows should be given, particularly when the intestines are tympanically distended, because, by heavy blows, the tympanitic resonance of the stomach and intestines is developed and the splenic dullness is lost. The examination should be practiced with the patients always in the same position, because variations of the posture alone produced decided changes in the dullness.

In marked ascites, and in serous effusion into the left plural sac, the dullness of the spleen cannot be detected by percussion at all; it also disappears in intense tympanitis, so that, even when the hypertrophy of the spleen is considerable, a perfectly sonorous tympanitic percussion sound may be heard over the corresponding space. (Vogel.)

To discover enlargement of the spleen the fingers of the right hand should be placed directly under the left twelfth rib, just outside the mass of the lumbar muscles, with the fingers of the left hand a little to the left of the middle line, in front and half way between the umbilicus and the ensiform cartilage; then press the parts forward with the right hand, and backwards and to the left with the left hand; then the enlarged spleen may always be readily felt in the left hypochondriac region. We know the hard mass we feel to be the spleen by the sharpness of the anterior margin, by the anterior margin passing from under the cartilage of the eighth, ninth or tenth ribs, obliquely downward and inward toward the median line.

The obliquity of this line is such that usually if continued downwards, it would cross the median line about half way between the umbilicus and the symphisis pubis: the anterior edge is usually nearer the middle line in front in the child than it is in the adult, because in the child there is a fold of peritoneum, not usually, if at all described in English books on anatomy, extending from the left side of the arch of the colon to the last twelfth rib, and over the anterior edge of this the spleen must pass before it can extend low enough to be detected by the hand. This fold of peritoneum causes the enlarged spleen to lie more forward as well as to have a more oblique position in the child than in the adult. (Jenner.)

Therapeutics. *Aranea*, *Ars.*, *Carbo veg.*, *Ceanothus*, *China*, *Ferrum*, *Lachesis*, *Laurocerasus*, *Nat. mur.*. *Ranunculus bulb.*, *Ruta*, *Sulphur*. *Agnus castus* should also be thought of. One case, a girl of ten, came under our observation where the spleen filled quite half of the abdominal cavity as the result of intermittent fever. *Arsenicum* seemed to relieve her somewhat, but she finally died about puberty of hæmoptisis

SPLENITIS, LIENITIS, INFLAMMATION OF THE SPLEEN.

This disease is very rare, and is never primary, but always secondary or metastatic. The inflammatory centres are usually sharply defined and wedge shaped, dark red at first in color, but afterwards of a yellowish brown or bright yellow, friable, and in exceptional cases, occupied by small abscesses. They are usually the result of embolic impaction of exudation from the valves of the heart, or of purulent particles in cases of pyæmia.

The symptoms include more or less marked enlargement of the spleen, with tenderness on pressure and in cases of suppuration, shivering or rigors. These abscesses may, first, become encysted; second, cause pyæmia, third, burst and discharge their contents into the peritoneum, fourth, form adhesions with neighboring organs and perforating the stomach, colon or pleura discharge into the cavities of these organs. As in some degree associated with the inflammatory process mention may be made of syphilitic new formations in the spleen, [illegible] lardaceous looking nodules of a whitish gray color, and the tubercular deposits seen as gray miliary nodules or masses of larger size, occupying the peritoneal surface and scattered through the substance of the organ. (Steiner.)

Therapeutics.—*Aconite*, *Aranea*, *Arnica*, *Ars.*, *Asaf.*, *Bry.*, *Caps.*, *China*, *Conium*, *Ign.*, *Iodine*, *Natrum carb.*, *Natrum mur.*, *Nux vomica*, *Ranunculus bulb.*, *Sulphur*.

Jahr says: In chronic splenitis, *Ars.*, *Sulph.* and *Capsicum* generally prove the most efficient remedies. Dr. J. C. Burnett highly recommends *Ceanothus americanus.*

INTERMITTENT FEVER.

This disease has come to be regarded as splenic fever. Congestion of the spleen, either spasmodic or permanent, gives rise to intermittent fever symptoms, as was well illustrated in a case of cancer of the spleen, recorded in *The Medical Investigator*. Vol. VIII. p. 59.

Intermittent fever occurs just as often in young children as in adults, cases are recorded of infants being born with enlarged spleen, and suffering febrile paroxysms at the same hour in which the mothers had their paroxysms during pregnancy. The following description refers only to children under two years.

Symptoms.—In children the quotidian type is the most frequent; still the tertian and even the quartan also occur. The hour in which the attack comes on is not always the same; the paroxysm, however, is always confined to a certain period of the day; the morning, afternoon or evening, As regards the attack itself, it is usually not fully developed, but rudimentary in one or more of its phenomena. Actual chills, it is true, occur, in which the children are seized with shivering, low moaning, collapse, and have blue lips and nails; immediately after they become decidedly hot, have a dry skin, great thirst and restlessness, and finally break out in a general perspiration, thus completing a perfect picture of an intermittent febrile paroxysm. As a rule, however, the symptoms are not so conspicuous, and often leave the malarial character to be divined by their recurrence every day, or every other day at the same hour. The shivering chills are often totally absent, and a remarkable paleness of the skin, blueness of the nails and lips, discoloration around the eyes, cold extremities and low whimperings, or slight convulsive twitchings of the facial muscles are only present. The pulse does not become very much accelerated, but very small. Respiration is normal, as to frequency; the breath does not become cool, nor does the temperature of the mouth sink in the least. During the various symptoms, representing the cold stage, children rarely pass any urine; but if they have partaken of much milk shortly before, they generally throw it up. This stage never lasts longer than one, or, at the most two hours. During it the child presents a most critical appearance, and the physician may seriously compromise his professional reputation if he should give a prognosis immediately after first beholding the child.

In the second stage the vessels of the skin become turgid, the face is flushed, the pulse harder and quicker than in the cold stage, the cardiac impulse stronger and felt over a larger area. There is very great restlessness, the child cries aloud, and, is frequently attacked by convulsions, conjointly with which the pupils become remarkably dilated. The urine and stools are retained.

This condition may last from two to three hours, and is much more correctly observed and described by mothers than the cold stage. But it is also often transient, lasting barely one-quarter of an hour. It is followed by a slight perspiration.

While the patients are awake the perspiration is not very well marked; the skin, it is true feels moist, but drops of sweat are very seldom seen upon it; free perspiration takes place only when sleep ensues. The heat and redness of the face then diminish, the thirst decreases, and the urine is discharged tolerably dark in color. The pulse assumes again its normal condition, and the patients once more presents the signs of general good health. But, in the intervals of freedom from fever, they are seldom perfectly well; are generally very restless, have less appetite, and a sluggish irregular digestion. The febrile paroxysms are frequently so little pronounced that an observation of several days is necessary in order to confirm the diagnosis.

The intermittent fever cachexia in small children is very soon established, as early as after one to two weeks, and is characterized by the following symptoms:

Anæmia appears very rapidly, the color of the skin becomes perfectly white, or turns to a slight grayish tint, the lips and mucous membrane become pale, the emaciation progresses and becomes marked, slight œdematous swellings form under the eyes, the enlarged spleen is easily felt, and, when the emaciation increases, may even be seen. The liver also swells up, and its parenchyma becomes indurated (lardaceous liver.) The intestines are tympanitic with gas, the stools are mostly diarrhœal, and, in the last days of life, sometimes mixed with blood.

The granular pigment matter usually found in the blood of adult intermittent patients, seldom occurs in that of children, because a prolonged cachexia is required to produce it, which in children is not generally the case, as they die of the disease too early.

Morbid Anatomy.— It is rare that a child dies during the attack, but in regions where pernicious fever prevails, death may occur even with the first paroxysm. The appearances are then purely negative; a slight swelling of the spleen, with a superabundant amount of blood in the whole venous system, being the only abnormities. But in the bodies of infants who have perished from the cachexia of intermittent fever, various morbid changes are met with, such as anasarca and effusions into the serous cavities, lardaceous liver, large lardaceous spleen with brown or black pigment matter most profusely accumulated in the spleen, in the liver, in the brain, upon the mucous membrane, and in the kidneys, which are also frequently affected with Bright's disease. In such cases the urine found in the bladder is always albuminous and casts may be seen with the microscope, in its sediment. (Vogel.)

Treatment.—The time of the attack, its character and the symptoms during the interval must decide the choice of the remedy. *China* is most frequently indicated not only for the paroxysm, but also for the digestive symptoms. Prominent among these are a red tongue, no appetite, abdomen bloated toward evening, and the stools loose and flatulent. If there is more fever, that takes on a remittent type, *Gelsemium* has proved efficient. If there is great restlessness with thirst and rapid emaciation with chill about 1 P. M., *Arsenicum* would claim our first thought. If there is a fitful ravenous hunger while the child is pale and passes pale urine, rubs its nose and starts in sleep, *Cina* is indicated. (Compare *Mercurius.*) If there is the peculiar nervous restless peevish quarrelsomeness *Chamamilla*, that remedy may be compared with *Nux vomica*, *Coffea*, *Aconite*. Jahr says that in cases of children, select between *Chamomilla*, *Aconite*, or *Ipecac.* If the children are stout, then the choice would lay between *Capsicum*, *Calcarea*, or *Natrum muriaticum*. In addition to these remedies, *Belladonna*, (if the child is Irish. Parsons; or *Nux vomica*. Lippe.) *Veratrum alb.*, *Ferrum*, *Bryonia*, (if a negro), or *Pulsatilla* (if a German. *Kali bich.* Lippe.) *Carbo veg.* may be indicated. If attention is given to the prevailing type of disease, and remedy most frequently indicated, the selection will be facilitated.

Great care must be exercised in feeding these cases, as active digestion increases the size of all the glands. We may need to select the most infantile form of food till the disease is cured, when we may return gradually to stronger food. (See Foods.) For a more full consideration of this subject, see Diseases of the Spleen by Morgan.

DISEASES OF THE SUPRA-RENAL CAPSULES.

Whatever may be the function of these bodies they belong chiefly to infantile life. They are classed with the vascular glands by Carpenter and deserve more careful study by pædologists.

Development.— The super-renal bodies arise in the meso-blast before the seventh day of incubation as two separate masses of blastema, situated between the upper end of the Wolffian bodies (or fœtal urinary organs) and the sides of the aorta; being totally independent (as concerns their development) of those bodies and of each other. The cortical and medullary portions have a distinct origin. From an early period the minute structure of these bodies bears a close resemblance to that of the spleen, consisting of the same elements as that gland, and the general history follows a very similar course, with the exception that they attain their largest relative size as early as the twelfth week of fœtal life. (Carpenter.)

They are double organs, in regard to whose functions we are totally in the dark. Enclosed in a capsule they present considerable variety of substance, both from an anatomical and physiological point of view; there is to be distinguished a cortical and medullary portion. *The cortical substance* is marked with radiating streaks, varying in color from a brown or reddish, down to a whitish-yellow, and is of a tolerably firm consistence. A dark, narrow boundary zone may be observed between these two portions, usually yellowish-brown, but at times greenish or blackish brown. After death this breaks down rapidly, and becoming fluid, cause the loosening of the medullary part of the organ from the rest. (Frey.) It is principally formed of a stroma of connective tissue, so arranged as to leave a series of oral spaces lying end to end with some indistinct indications of a tubular structure; the spaces or tubes are filled with a finely granular plasma containing fat particles, neuclei corpuscles, and cells.

The medullary substance consists of a basis of fibrous tissue which is continuous with processes that come off the sheath of the cortical substance, and supports a plexus of tubes filled with finely stellate or polygonal granular cells together with numerous blood-vessels and nerves. The supra-renal bodies are more highly supplied with nerves than any other gland-like structure in the body. Kolliker counted no less than thirty-three branches proceeding to one of these bodies, derived from the sympathetic pneumo-gastric, and phrenic nerves and which, after passing through the cortical, formed a dense plexus in the medullary portion. (Carpenter.)

Anomalies.— Complete absence of the supra-renal capsules is only observed in very imperfect monstrosities. It occurs much more frequently — although still rarely — that the supra-renal capsule found lying in the same capsule with the kidney, being bound to the cortical portion of the latter by firm connective tissue.

Not unfrequently, also, there occur accessory supra-renal capsule, varying in size from a millet seed to a pea, sometimes in the immediate neighborhood, and sometimes actually imbeded in the tissue of the normal supra-renal capsules. A supra-renal capsule has been seen, that was formed out of a great number of small accessory bodies, each of which on section presented the appearance of a supra-renal capsule.

Hæmorrhages have been observed most generally in newly-born children in whom they have produced a fatal loss of blood. Fiedler describes two cases, in one of which a severe extra- and intra-peritoneal hæmorrhage had caused the death of a child four days old. In the posterior of the right supra-renal capsule was found a tumor the size of a hen's-egg, which proved to be a hæmorrhagic supra-renal capsule. The cells of the tissue of which was to be affected with intense fatty degeneration. Similar fatty degenerations with slighter hæmorrhages are described by Fiedler in a second case. (Merkel.)

Addison's Disease, though not demonstrated by post-mortems, is of very probable occurrence in those children who present a discolored, bronzed appearance of the skin.

Treatment.— Hughes suggests in this disease, *Arsenic*, and *Calcarea arsenica.*

DISEASES OF THE THYMUS GLAND.

The thymus is a ductless gland, a double organ, whose function is unknown, and which is, as far as we are at present aware, similar to a lymph node in structure, existing in full development only during the early periods of life, falling, later on, more and more a prey to fatty degeneration. Thus it is only exceptionally to be recognized in the bodies of older individuals. (Frey.) (See Anatomy, Vol. I, p. 118.)

Development.—The general structure of this gland may be best understood from the simple form it presents when it is first capable of being distinguished in the embryo. It is then solid, but soon breaks down in the central part so as to form a single tube closed at *both* ends, and filled with granular matter; and its subsequent development consists in the lateral growth of branching off shoots from this central tubular axis.

In its mature state it consists of an assemblage of hollow glandular lobules, united together by connective tissue; and their cavities all communicate with the central reservoir, from which, however there is no outlet. Each lobule is bounded externally by an indistinctly fibrous or almost homogeneous membrane which sends proliferations into its substance that divide it into "acini" or gland lobules. Isolated gland granules of the same kind are frequently to be met with on the main canal. The parenchyma of each lobule or follicle is made up of a plexus of connective tissue fibres with lymph spaces which contain lymph corpuscles; larger, coarsely granular spheroidal bodies, composed of protoplasm and containing one or several neuclei. Between the numerous vessels and attached to them as well as to the connective tissue of the septa an exceedingly compact but very delicate network is extended, chiefly formed by the anastomosing branches of multipolar cells, in the interstices of which are numerous lymph corpuscles, which is formed by the prolongations of the intra-follicular lymphatic vessels. The whole structure of the follicles resembles that of the peyerian bodies. The chemical constituents of the thymus are water, albumen, sugar, fats, leucin and sarkin, with xanthic, formic, acetic, succinic and lactic acids, with the ordinary inorganic salts. (Carpenter.)

VARIOUS DISEASES OF THE THYMUS.

Hæmorrhage.—In new-born and in still-born children, Weber found small hæmorrhages into the parenchyma of the thymus. They have been found singly and in multitudes, associated with intense hyperæmia of the entire organ, and generally do not attain to a size larger than a pin's head. Usually ecchymoses are also found in the other organs. Weber attributes all these extravasations to the act of delivery *per se*, and states that they are only absent in rare cases, as for example, a small child delivered from a large pelvis dead, from any cause, which could not be ascribed to the circumstances of pressure.

Tuberculosis of the gland not unfrequently occurs; and even the large genuine tuberculous masses which generally have their site in the bronchial glands, have been seen in the thymus gland, while the former were free.

Carcinoma of the anterior mediastinum has been found in children, the lungs of whom were but very little implicated; the pleura and pericardium being also free, it therefore appears probable that the disease originated from the thymus gland.

Affections of the thymus gland, with the exception of carcinoma of the anterior mediastinum, which may be detected by extensive dullness over the anterior half of the chest, and manifests itself by pressure upon the heart, large blood vessels and the lungs, cannot be diagnosticated. (Vogel.)

Calcareous Degeneration of the gland is of exceptional occurrence.

Laryngismus Stridulous, Millar's asthma, Thymic asthma of Kopp, at one time was supposed to be due to disease of the thymus, but this theory is now entirely dispelled.

Hypertrophy.—In rickets the thymus gland is often enlarged and exhibits on section the usual pale transparent look from infiltration with the same albuminoid substance as the other internal organs. (E. Smith.)

As far as I can learn there is no literature on the therapeutics of this gland. (See Thyroid.)

DISEASES OF THE THYROID.

The thyroid gland is situated at the upper part of the trachea, and consists of two lateral lobes, placed one on each side of that tube, and connected together by a narrow transverse portion—the isthmus. The thyroid body differs from the other vascular glands in its elementary structures; for it essentially consists in aggregation of vesicles which seem to be furnished with a true limitary membrane and therefore to be real gland vesicles embedded in a stroma of connective tissue, which supports a vast cavernous lymphatic network. The vesicles vary in diameter in the human subject from 1-2000 to 1-85 of an an inch, and they contain an albuminoid plasma of either a faintly granular or of a somewhat oily aspect which may be seen to exude from the epithelial cells lining their interior. The vascular supply of the thyroid body is extremely abundant, and the subdivisions of its arteries form a very minute capillary plexus upon the membrane of the vesicles. The lymphatic spaces are lined by a layer of epithelium, which is often the only septum between the interior of the vesicles and the lymphatic spaces. The nerves are scanty accompanying the vessels and are derived from the cervical parts of the sympathetic.

This body, like the supra-renal and thymus, is of larger relative magnitude during intra-uterine life and infancy than in after life.

Development.—From Remak's investigations as to its origin, it would appear that the thyroid springs in the form of a succule from the middle line of the anterior wall of the pharynx, and is formed consequently in the same manner primarily as the glands of the intestine. Soon after, however, it becomes completely separated from the pharynx, and out of the single vesicle two sacs are formed by division, which assume a lobulated appearance from indentations and constrictions which are eventually developed on them. In the thickened walls of these sacs solid aggregations of cells are consequently formed, which are developed later on into the gland vesicles of the organ, becoming invested with an envelope of connective tissue, within which a certain amount of fluid collects among the elements. The large main vesicle on each side appears likewise, to give origin to

EXOPHTHALMIC GOITRE—BASEDOW'S OR GRAVE'S DISEASE

This disease is very rare in childhood but some cases are reported, thus Devol observed it in a girl of two and a half years; Rosenberg in one of seven years, Solbrig in a boy of eight, and Trousseau in one of fourteen.

Hereditary influence is in some cases probably of importance, but the observations on this point are not yet sufficient. The first symptoms are palpitation of the heart, and acceleration of the pulse, occurring first at intervals, then becoming permanent. When these symptoms of disordered circulation have lasted for some weeks or months, the second chief symptom, *struma* is developed slowly or rapidly, often within the course of a few days; its usual form is that of a swelling of soft elastic consistency, distributed uniformly over the whole thyroid gland. It is less common to find only one lateral lobe affected; in other cases both are involved, but one more so than the other. The surface of the tumor is often marked by veins greatly dilated and crowded with blood; the hand laid upon it feels almost everywhere a distinct fremissement, and auscultation reveals loud blowing sounds. These symptoms may subsequently diminish or disappear while the tumor assumes a somewhat firmer and more resistant consistency. This seems to depend on the fact that the early hyperæmia and dilatation of vessels yield at a later period. The struma of Basedow's disease seldom reaches a considerable extent.

Exophthalmos makes its appearance soon after the struma, and is almost without exception bilateral. In degree it varies extremely; sometimes there is but a slight prominence of the eyeball, sometimes the protrusion is so excessive that no part of the globe is covered by the eyelids. The prominent eyeball has an unusual lustre and a peculiar stiffness; in fact if the deformity has existed long, it often loses its mobility in great part or wholly. It is not always equally distinct, but often increases and disappears proportionately to the force of the pulsations of the heart, and sometimes may be diminished by light pressure on the eyeball. It is almost always accompanied by a phenomenon first observed by von Graefe, the upper lid loses its power to move in harmony with the eyeball in the act of looking up or down.

Another and a rare group of symptoms must perhaps be regarded in some cases secondary as a sequence of the exophthalmos and the glandular elements by undergoing constriction at various points and seems thus to work its own obliteration.

The thyroid gland is probably at its greatest pitch of development in the new-born infant and becomes very sluggish in growth a few weeks after birth. (Frey.)

GOITRE—BRONCHOCELE.

This affection is more frequently met with, at, or near puberty, than in early childhood. It consists in an enlargement of the entire gland or of one of its lobes, sometimes causing embarrassment to respiration by pressure upon the trachea. It is then a serious obstruction, particularly when the enlargement extends beneath the sternum or the sternal portion of the clavicle. It is frequently met with in young children in certain localities, such as Derbyshire, England, and in some of the deep valleys of Switzerland. In these districts the disease is part of a cachexia, and is supposed to be due to the quality of water drank.

In some cases the fascia in front of the neck is denser than common and the gland is restrained from advancing; it then pushes its way laterally, and is apt to be more prominent on the right side than on the left.

Treatment.—*Spongia* is the classic remedy and the one most frequently efficacious: if this fails *Iodine* high may be administered particularly where the gland is very *hard; Bromine*, according to Hering's advice should be administered to blondes, while, the preference for *Iodine* should be given when the patients are brunettes. Jahr follows *Spongia* when it fails, with *Sulph.*, *Iod.*,*Natr.* c., and *Bromine. Calcarea*, *Lyc.*, and *Causticum* are also recommended by him.

Goullon mentions *Calc. iod.*, *Ferrum*, and *Apis.*

Belladonna.—Heat and rush of blood to the head; pain in swallowing; gland painful to touch.

Calcarea c.—In scrofulous persons, worse toward new moon.

Natr. carb.—Pressing pain, round hard swelling on the upper right part of the gland.

It should be remembered that time and perseverance are required to effect a cure.

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Another and a rare group of symptoms must perhaps be regarded in some cases secondary as a sequence of the exophthalmos and the defective power to depress the upper lid. These symptoms are disturbances in the nutrition of the bulb, especially in the outer coats of the eye, the conjunctiva and cornea. The impairment of the power of moving the lid prevents the eye from receiving its due share of moisture, whence come dryness in the conjunctival sac, distension of the conjunctival veins and conjunctivitis. In the majority of cases nothing worse occurs; but in bad cases severe disturbance of nutrition of the cornea follows. Among the less constant symptoms must be mentioned the elevation of the bodily temperature. The patients feel this even when very slight, as a sense of heat often accompanied by an increased secretion of sweat. Charcot and Dumont however, report cases in which the temperature was normal. (Eulenburg.)

The prominence of the eyes is believed to be due to an excess of intra-orbital fat, dilated vessels, etc. Generally the disease drags on for months or years.

Treatment.—*Belladonna* has proved curative in the hands of Dr. Kidd. (*British Journal of Homœopathy*, Vol. XXV, p. 187.)

Dr. J. S. Mitchell reports a case cured with *Arsenicum* 30. (*The United States Medical Investigator*, Vol. VII. p. 501.)

DISEASES OF THE LYMPHATIC SYSTEM.

The lymphatic system seems to be lost sight of by most pædologists. This is rather strange when we consider that it is the great absorbent system, the connecting link between the alimentary canal and blood current on the one hand, and it being essentially an accessory venous system on the other. The neglect is chiefly due to the obscurity that has involved their functional activity. It is a fact that all of the glands of the body puzzle physiologists. Recent investigations have thrown much light upon this whole subject, and the lymphatics are being recognized as the white-blood manufactories, while the spleen, thyroid, etc., generate the red blood corpuscles. The diseases of this system have been little understood, but recently the following have been assigned to it: sclerema, scrofula (so-called), tuberculosis, phlegmasia alba dolens, elephantiasis, typhoid fever, leucæmia, tabes mesenterica and chlorosis.

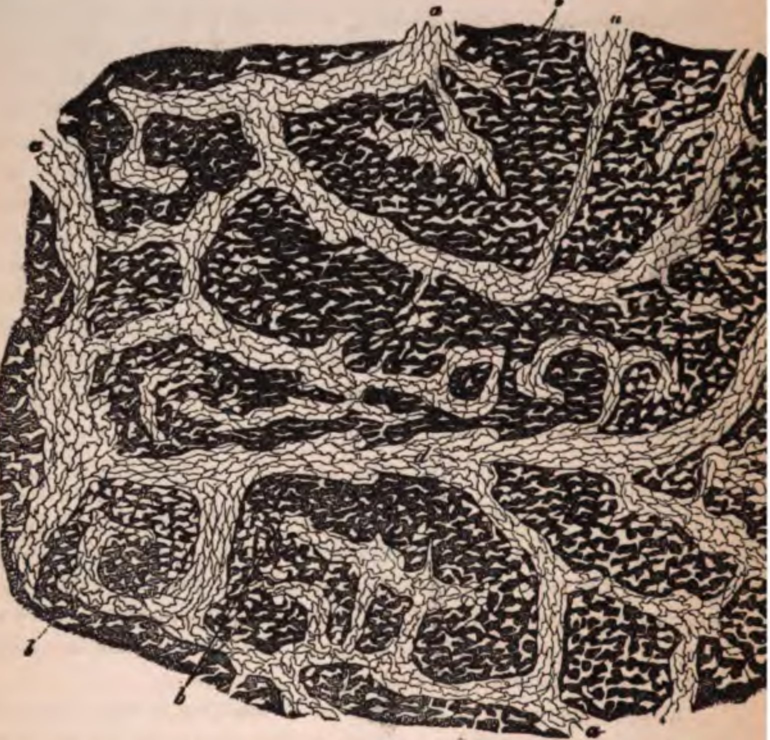
ANATOMICAL STUDY OF THE LYMPHATICS.

In taking a general survey of this system, we notice that there are two chief points of convergence. The first and most important is of the mesenteric or lumbar glands with their receptaculum chyli and thoracic duct outlet. The other is of the cervical glands. Both empty into the subclavian veins.

This system is made up of glands and connecting vessels. The vessels arise by a plexiform network which are really inter-cellular spaces. (See accompanying illustration.)

These lymphatic capillaries are most numerous in the loose tissues where the most pressure is brought to bear on the arterioles. It seems strange that there should be a supplementary venous system, but if we remember that the blood vessels are continuous and cannot absorb all the serum that oozes through its meshes, but must receive the denser debris, we can understand the necessity for this lymphatic system.

It is made up of long valvular tubes, whose valves give the vessels a knotted appearance. These tubes divide as they enter the glands and then anastomose to form a plexus from which vessels emerge that unite to form tubules, and perhaps pass through several glands before reaching the duct that enters the subclavian vein. Within this plexus is a group of cells not unlike the acini of a secreting gland. The lymph or serum (albumen and water) that enters passes into these cells and then out, with the addition of globules in fibrous envelopes.



Diaphragm; *a*, lymphatic capillaries, with the contours of the epithelial cells; *b*, first appearance of the cells; *c*, connective tissues with serious canals ; *d*, flask-shaped dilatations. Magnified 60 diameters. (After Stricker.)

The fluids found in this system are lymph and chyle. The former is the serum picked up by the re-absorbents, while the latter is found in the absorbants or lacteals.

The chyle contains only a little more albumen than the lymph and much more fat and less water, as we see by the following tables :

LYMPH.

Water		96.5
Albumen		1.2
Fibrin		1.2
Animal extractive		1.319
Fat		a trace.
Salts	Alkaline phosphates	
	Chloride of Sodium	
	Carbon	
	Sulphur	
	Oxide of Iron	.5

CHYLE.

Water	90
Albumen,	3
Fibrin	37
Animal extractive	1.23
Fat	3.6
Salts	.7

BLOOD.

Water		78
Solids		20
The solids consist of	Fibrin	.15
	Corpuscles	11
	Albumen	6.4
	Salts	3.6

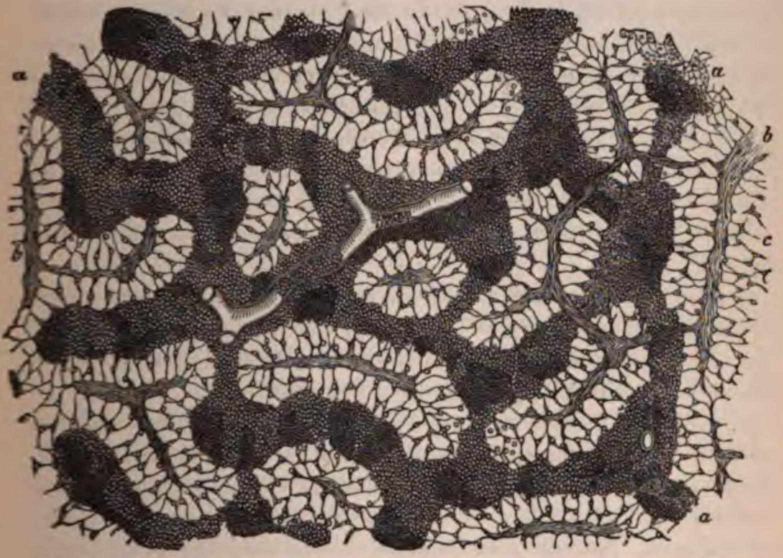
The conglobate glands or glands proper of the lymphatic system, are located chiefly in the mesenteric, lumbar, inguinal, axillary and cervical regions, are divided into superficial and deep, and follow the blood vessels. This is important to remember. In the inferior extremities the chief glands are at the groin and popliteal space, occasionally at the instep and upper tibial region. The inguinal glands are connected with those of the lumbar region. The lymphatics of the abdomen converge from the stomach, intestines, liver, spleen, pancreas, kidneys, etc., to form the lumbar glands, which are large and numerous, and empty into the receptaculum chyli, (situated in front of the second lumbar vertebræ), whose duct passes upward and empties into the left subclavian vein. When this duct is partially occluded, nutrition is materially interfered with, as was the case of the Boston living skeleton. Stenosis of this duct or hypertrophy of the lumbar (mesenteric) glands occur more frequently than we are able to record.

The lymphatics of the upper extremities, head, chest and upper border of the liver converge to form the cervical glands. These are also divided into superficial and deep, the superficial of the arm have glands at the elbow, and axilla, but the deep occur more numerous. At the elbow they lie above the radial artery. The axillary glands are of large size, accompany the axillary vein and artery, and empty into the ductus lymphaticus dextra. On the left side the lymphatics empty into the thoracic duct near its outlet. The lymphatics of the chest are both superficial and deep; the superficial empty into the axillary glands; the deep run directly to the neck and empty into the ducts of the right and left side. The lungs and heart are also provided with superficial and deep lymphatics, the vessels of the heart uniting with those of the lungs. The lymphatics of the lungs whether superficial or deep, follow the blood vessels, run along the bronchi, and enter the large glands at the bifurcation of the trachea. The bronchial glands are ten or twelve in number, the largest being placed opposite the bifurcation of the trachea. At times these become enlarged, and compress and narrow the canal of the bronchi and blood vessels, as in so-called scrofula, tuberculosis, etc.

The lymphatics of the head are both superficial and deep, the superficial being found under the scalp and unite in anterior and posterior groups in the occiput and temporal region, while those of the face discharge into the submaxillary and parotid groups. These glands are chiefly involved during the existence of crusta lactea. The deep lymphatics of the head are divided into meningeal and cerebral; the former accompanying the meningeal vessels, the latter are found between the arachnoid and pia mater and in the choroid plexus, and passing through the foramen magnum, terminate in the deep cervical glands. The cervical glands are superficial and deep, the superficial converge at the angle of the jaw, then with the deep cervical which empty into the right and left lymph ducts. Obstruction of the superficial glands about the head and neck in infancy is apt to be followed in after life with obstruction of the deep cervical and bronchial as we shall see in speaking of tuberculosis. The fact that the lymphatics follow the blood vessels, and that the glands are located in the loose cellular tissue where fat is deposited, is significant, as we shall see in studying the functions and diseases of this system.

Lymphatic vessels vary in diameter from one-tenth to one and a half lines. The medium sized tubes, according to Kolliker and all the larger ones, according to Recklinghausen, are composed of three coats or tunics, viz., the tunica interna, tunica media, and tunica adventitia. The first or inner of these tunics is rich in elastic fibres, and lined with a single layer of tesselated epithelium; the second or tunica media is composed almost exclusively of muscular elements; while the external tunic is formed of the surrounding connective tissue. Only the two former accompany the tube in its ramifications through the lymphatic glands. Externally the tube presents a nodulated appearance, which is due to sacciform dilatation on either side of the valves, which like the valves of the veins are formed by projecting folds of the internal tunic, but which are here more numerous. Lymphatics may be distinguished from the veins by their muscular coats, their lighter color, and the character of their contents, and from the arteries by their thinner walls and valvular structure.

The pouching of the lymphatic tube already referred to is most observable during engorgement of the vessel, and may be seen in the abdominal lymphatics during absorption of food from the intestinal tract. In the afferent lymphatic tube leading to the gland, the concavities of the valves are turned toward the gland, which serves to facilitate movement in that direction, while in the efferent vessels the concavities are turned in the opposite direction.



Section of the medullary substance of a lymphatic gland (from the ox); *a*, follicular cords; *b*, trabeculæ; *c*, lymph path. Magnified 120 diameters. (Stricker.)

Lymphatic glands consist essentially of two substances, an external cortical and an internal or medullary substance. The former partakes of the character, and is in fact composed of connective tissue; it extends into the gland, separating it into follicular spaces, and forming; what is known as trabeculæ and the lymph path. In the dilitation of the vessels in the medullary substance is found some gland substance with a follicular cord. In the gland the lymphatic tubes are opened out; the valvular structure of the tubes already referred to being so arranged as to insure a passage of lymph through the gland, though with far less rapidity than through the tubes. (Buck). [See illustration.]

On a microscopic examination of the lymphatics of the peritoneum, particularly of the omentum, the veins have the appearance of being accompanied by a lymphatic on either side; a more careful examination, however, renders it evident that the vein is within a larger lymphatic, constituting an imagination of the vein. These invaginations are of various kinds. One of these is where a vein is invaginated for a considerable part of its course, at the same time all its branches, so long as they are not capillaries, are also invaginated. (Thomas.) Thus a wide lymphatic vessel is found invaginating a venous trunk; the vein collects a small number of capillaries which come off from a small arterial branch. The lymphatic vessels, however, does not cease to exist as such at the point where the capillaries debouch in the vein, . . . but continues on to the artery in such a way that the whole system of the capillaries is invaginated in a sacciform dilation of the lymphatic vessel. Not till the root of the artery is reached does the lymphatic, as such, cease to exist, at which point it looses itself in the lymph canalicular system accompanying the artery.

A lymphatic vessel that simply accompanies a vein possesses a blind sacciform dilatation, in which the system of capillaries belonging to the vein, is inserted like the glomerulus of a Malpighian corpuscles of the kidney. (Klein's Anatomy of the Lymphatics.)

The Relation of the Lymphatics to Serous Membranes deserves notice. In 1862, Recklinghausen succeeded after a series of experiments, in showing that both dissolved and undissolved substances injected into the serous cavities, find their way into the lymphatics of the serous membranes. This was soon followed by the discovery that the serous membranes, particularly the peritoneum and pleura, presented at various points minute orifices, surrounded by radiating epithelial cells, and constituting little mouths or stomata, which are continued as a short, vertical channel, opening at right angles into a straight, lymphatic parallel to the surface. These vertical passages are lined with epithelial cells, as are the lymphatics into which they open. From this view it would appear that the serous membranes are but appendages to the lymphatic system, consisting of vast expansions of the lining of these vessels. The physiological importance of this arrangement has not as yet been satisfactorily demonstrated. In inflammation of the serous membranes a remarkable proliferation of the epithelium, particularly around and within the stomata takes place, these cells falling partly into the cavity and partly into the lymphatic vessels, the former probably degenerating into pus cells, the latter becoming lymph corpuscles.

According to Schwalbe the arachnoidean space of the brain and spinal cord is a lymph space which communicates with the lymphatic vessels and glands of the neck through the jugular foramen as well as with the lymph canals of the three higher organs of sense.

According to Buhl the epithelium of the alveoli of the lungs has less the signification of a continued bronchial epithelium than of a lymphatic endothelium spread out on the inner surface of the alveolar wall, bronchial epithelium passes into alveolar epithelium, just as the epithelium of the Fallopian tubes passes into the endothelium of the peritoneum. Sikorsky makes the lymphatic plexus in the walls of the alveoli communicate by means of fine openings with the lumen of the alveoli. Therefore the cavities of the alveoli are wide lymph spaces filled with air.

DEVELOPMENT OF THE LYMPHATICS.

The origin of the lymphatics is not certainly known. It is most probably in the so-called plasmatic canals, spaces of the smallest size found in the connective tissue, without a special membrane, but provided with flat nuclear so-called endothelium, usually filled only with liquid. In the central nervous system, the beginning of the lymphatic vessels are peri-vascular spaces, *i. e.*, broad canals clothed with endothelium (or perithelium) in the axis of which are found the blood vessels. In glands, the origin of the lymphatic vessels is identical with fissures occurring between the blood vessels and the glandular canaliculi. (Wagner.)

A *peculiarity* of this system that must be noticed is. that both vessels and glands may be increased or diminished in number according to the needs of the system. The fact that the lymphatic vessels arise in an "irregular network," or rather in the interstices of the tissues, especially the cellular, it is easy to see that the vessels would, like improvised streams from a rain, be increased or diminished as the pabulum increased or diminished. As the glands are but meshes of interlacing vessel, so these may be increased far beyond those ordinarily found. One case in Indiana was recorded in the *Medical Examiner* where these glands on the whole body were so numerous that one could scarcely put a finger on a spot that would not touch them. This condition resulted from persistent intermittent fever, or in other words splenic fever. They varied in size from a small pea to the size of walnuts, forcibly reminding us of one form of leprosy. In other cases they are so atrophied and absorbed that they can be found with difficulty, as in one case at the Foundling's Home, that subsisted on cracker water for months, no other food would agree. The lymphatic glands were very much atrophied and many of them seemed to have been entirely absorbed.

ANOMALIES OF THE LYMPHATIC SYSTEM.

Dr. A. R. Thomas, of Philadelphia, reports the following cases of congenital termination of lymphatics on the surface of the body:

1. Some years ago I had under treatment for some pulmonary trouble, a young man, who on one occasion desired to call my attention to a peculiarity upon the upper and inner portion of his left thigh. Upon exposing the part, the surface to the extent of half an inch or more in diameter presented a glazed appearance, as if covered with dried albumen. Upon moistening this surface with a little saliva, this glazed appearance was at once removed, when by pressure with the finger from below upwards, along the line of the lymphatics, there oozed from an almost invisible orifice, a small drop of clear, viscid fluid. His statement was that this peculiarity had existed from his birth and had never been a source of trouble of any kind. That this fluid was lymph, and that it escaped from a congenital opening communicating with a lymphatic vessel, was perfectly evident.

2. A lady called my attention to the neck of her boy, a lad of about four years, when just above the right sterno-clavicular articulation, a minute valvular orifice with red edges was plainly visible, and from which by pressure just above the clavicle, or frequently by movements of the head and neck, there would ooze a small drop of clear lymph. A fine probe could be readily passed obliquely down through the opening to the distance of half an inch. This peculiarity had been noticed by the mother soon after the birth of the child, and continues to the present time.

Beale reports similar cases,

PHYSIOLOGY OF THE LYMPHATICS.

The *function* of this system seems to be to absorb from the intestines and to reabsorb the stray serum from the rest of the body, and to pour these products into the circulation in the form of lymph or white blood corpuscles. It "gathers up the fragments that nothing be lost." The lumbar glands, as will be seen, are both absorbents and reabsorbents; while those of the chest and upper extremities are only reabsorbents. This is a fact worthy of notice, for Flint says they pick up sugar and urea. The reabsorbents seem the first to throw out the flag of distress in disease.

As the food passes on down, the fluid portion is being absorbed by the capillaries, and the lacteals. The former take up the albumen and sugar chiefly, while the lacteals of the villi absorb the emulsified fat and the remaining albuminous portions. The solitary glands are believed to belong to this system.

It is interesting to study the function of these glands. As the lymph reaches the glands by the many vessels that pour into it, and then terminate, it is then crowded through tortuous lymph tracts, and swell the corpuscles at the origin of the afferent vessels, and these are forced off and pass on more or less perfect lymph or white blood corpuscles. The lumbar glands being the largest give off the best developed cells. The white color is due to the emulsified fat. These cells have well-defined albuminous walls. When they reach the venous current on its way to the heart and lungs to be ærated, they lose their identity, doubtless by absorbing coloring matter from the blood. Recklinghausen saw lymphoid cells in the blood of a frog, become transformed into red blood corpuscles. (Frey.)

After a hearty meal the lymph or white blood-corpuscles are found in excessive quantities in the blood current. Where the lymphatic system is most active, the persons grow very fleshy. These facts lead to the view, that there is another step to complete the process of *sanguinification*. The spleen and liver no doubt take important parts in this work. In cases where the spleen is diseased as in chronic ague, leucocythemia, chlorosis, etc., we have a lymphatic digestion and assimulation chiefly. Mosher collected thirty cases of extirpation of the spleen in which changes are found like those attending leucæmia. (Neumann.) Mentagassa and Sussana speaking of the origin of fibrin in the blood, "It receives from the thoracic duct a large number of colorless corpuscles. In many conditions where an increase of the amount of fibrin is observed (during *pregnancy*, in the blood of the splenic vein) an excess of the white corpuscles may also be detected." The persons are usually in good condition as far as flesh, but the blood seems deficient in red corpuscles. Such persons are lazy and inclined to dropsical effusions, due to lack of the vivifying effect of the red blood or oxygen carriers. It would seem therefore that the entire system of glands make up a grand whole whose combined functions is sanguification, and hence are closely related in disease as well as in health.

It seems to me that the lymphatic system determines the division of the temperaments, or constitutions according to Grauvogl. If very active we have a lymphatic constitution, or as Grauvogl terms it, a hydrogenoid constitution. If this absorbent and reabsorbent system is less active, and the liver and spleen active, we will have a system loaded with carbon and nitrogen, a carbo-nitrogenoid constitution or bilious temperament. While if the enteric and lymphatic digestion is feeble and the nervous system active, we will have an acid condition of system (rapid oxidation of the body) or Grauvogl's oxygenoid constitution, which if extreme gives us a nervous or irritable condition.

The natural history of man, in passing from childhood to adult life, gives us about the same changes in the system. Children belong to the lymphatic era. The character of the food will change the constitution *e.g.*, if the child is fed on watery starchy food, the lymph will soon predominate, while if fed on dry and animal food the reverse will take place. The same effect is produced by moist or dry localities. Compare the Dutch with the Arab. Activity or quiet also may change the whole constitution. Thus it will be seen that this is a very important system, and one exceedingly active in infant life.

The lymphatic system as we would expect, is frequently diseased, in fact there is a marked predisposition to certain diseases, as we shall see.

ATROPHY OF THE LYMPHATICS (PERNICIOUS ANÆMIA).

This is a condition of the absorbent system that has not attracted much attention.

Congenital Atrophy.— We have seen that the lymphatic system is dependent for its functional activity, by the overflow of serum and white blood from the blood vessels among the tissues. When this is great, this system is active, and all the glands in that part of the body take on increased size. But the opposite condition of scanty serum will be followed by a decrease in the size and functional activity of this absorbent system. We can then comprehend how, if during intrauterine life the infant is supplied with a blood poor in white corpuscles and containing little serum, that at birth the lymphatic system will be feebly developed. The amnion is provided as a safeguard in such cases, but when it is scanty, as it often is in this class of cases, we have as a result, a child with feeble. absorbent powers. The nervous supply to this system must also be scanty from lack of development. Under such circumstances we can explain congenital atrophy of the lymphatic system, and its serious after consequences.

Acquired Atrophy.— This may be brought about in two ways: First, by improper food; and second, by disease. We have seen in studying the functions of the lymphatic system that the albuminates and liquid portions of the food are absorbed by the blood vessels, and that even starchy food may find its way through the capillaries into the blood current. The lacteals take up chiefly the emulsified fat with its albuminous or fibrinous envelopes. Now we can understand that if the milk of the mother is poor in fat but sweet and watery, that the globules will be so broken up that absorption be accomplished largely through the capillaries. The child will be apt to be colicky, but if "soothing syrups" are resorted to, the stupid intestines will take up enough to nourish the child some. In such cases the bowels are usually loose, or "just natural," as the attendants will express it, notwithstanding the opiate. If the fæces are examined, they will be found to be shreddy and possibly oily. We might suspect that the trouble was with the pancreas, but a careful study of the case would soon convince one otherwise. The same condition may be brought about if the child is fed on a food poor in fats and hard to digest. The lymphatic system takes up only what is poured out, the overflow. In cases of difficult digestion, the capillaries of the mucous membrane are all distended with blood from their partial congestion, and are therefore in a better condition to absorb, and thus in time rob the lymphatics of the work they were made for. This substitutive work will in time produce atrophy of the lymphatics.

All diseases interfere with the function of this system. Digestion is arrested and consequently absorption. Among all the diseases there is not one that robs this system of its normal function, like chronic gastritis during childhood. Few children escape this form of derangement of the stomach. They eat little and drink little. Their craving is for sour things, or food easily soured, like sweets.

The *symptoms* of atrophy of the lymphatics are very few and very plain. The child is thin in flesh, pale, or else red or blue if very young. It has much colic; fat food disagrees; the stools are shreddy, the child is very wakeful and grows but little. During the hot months the symptoms may assume those of entero-colitis, due to the irritating pressure of unabsorbed, decomposing food.

The *diagnosis* cannot readily be confounded with anything else. That omnibus word "indigestion" may mask the case and satisfy the friends for a time, but as the child does not improve, they will grow impatient. This form of trouble may be confounded with derangement of the liver, pancreas, or stomach, but a simple glance at the child, and a brief inquiry into its digestive powers, ought to settle the diagnosis. The marked case referred to that could not take milk and lived in the Chicago Foundlings' Home for nearly a year on "cracker-water," was the most striking case of congenital atrophy of the lymphatics, that has come under our notice.

The *prognosis* is grave, for its always a question whether the child can survive the great demand of the system, until the absorbents are dietetically and therapeutically developed. If not corrected in infancy, about puberty it will be apt to assume the grave form of progressive pernicious anæmia.

Pathology.—Complete anæmia of the tissues, is the most striking post-mortem appearance. The whole system seems atrophied. The lymph glandsare few and very small. In the lungs they may have taken on the degenerate inflammatory form of "miliary tubercle."

The *treatment* of atrophy of the lymphatic system is hygienic and therapeutic. The hygienic means consist of proper ablutions. Such a child has little vitality and should be washed very seldom, and then never with soap nor cold water. It should be bathed with warm water before a warm fire, and then oiled with sweet almond or olive oil. Fresh lard or butter will do. It may be oiled every night as that will ensure sleep, and at the same time more thorough absorption of the oil. If it is restless and hungry after oiling, then choose the morning. The superficial lymphatics are usually the best developed, and therefore the oil is best introduced into the circulation by the way of the skin. The air of the room should be slightly moist. Such children should be kept as quiet as possible, and all constricting garments loosened. The food should be the most easily absorbed that we can find (see Foods). It may be necessary to remove the casein by giving whey, and thus ensure capillary absorption. The food question will need to be studied for each case. The preparations of arrow root or rice water with milk (or whey) and warm water will usually prove the most bland and readily absorbed diet we can find. Intestinal irritation must be avoided.

The remedies indicated are those that help tissue development. In these cases we have to deal with imperfect development of the lymphatic and vegetative systems.

The remedies that stand in the front rank here are *Sulphur*, *Calcarea* and *Phosphorus*. If we can see the mother before birth and give her *Sulphur* one day and *Calcarea phosphorica* the next, we may insure a full development of this system. Should there be no other remedies indicated, *Sulphur* may be given the child one day, and *Calcarea phos.* the next day. These had better be given in powder at about the sixth attenuation. If this does not help them the third may be given. We are now selecting remedies that will quicken the vegetative system to its highest functional activity. As the child improves the remedies should be given less frequently. If there are no symptoms due to indigestion, then the similar remedy should be carefully selected for the totality of the symptoms. Such a remedy, be it *Arsenicum Lycopodium*, *China*, *Mercurius*, *Chamomilla*, *Belladonna*, *Nux vomica*, *Hepar*, *Iodine*, *Silicea*, *Dulcamara* or *Baryta carb.* will be more efficient than any stereotyped prescription. (See General Therapeutics.)

The older the child, the less prompt will be the change, and the more persistent should be the treatment. It is often difficult to get the friends to understand the nature of the trouble, and they may object to this "constant doctoring." They must be made to comprehend the serious nature of this malformation.

HYPERTROPHY OF THE GLANDS—LEUCOCYTHEMIA—LEUKEMIA.

Hypertrophy of the lymphatic glands is an increase of their parenchyma, thereby causing an abnormal size of these organs. We must exclude, therefore, all those increases of volume in the lymphatic glands which are the consequences of exudation, infiltration, or new formation. The microscopical examination shows in the genuine hypertrophy only the normal elements of the gland, and the total absence of any pathological new formation. In the interior of hypertrophied glands, we observe a reddish-white, somewhat flabby parenchyma, from which is discharged by pressure, a watery and somewhat turbid fluid. This disease is mostly found in childhood, in individuals of a so-called lymphatic habitus, although we may see it sometimes even in manhood. Sometimes it attacks only certain parts of the system of lymphatic glands, (*i. e.*, those of the abdomen) at other times extends over the whole system (even to the glands lying in the cavities of the body.)

Hypertrophy of the glands first causes uneven, not painful, not very hard, rather soft swellings, of the size of a pigeon's egg; similar swellings may be found in the lumbar, mesenteric, epigastric and bronchial glands.

This hypertrophy of the lymphatic glands is a disease which develops slowly and gradually, is chronic and may exist for years. Often we observe with it a hypertrophic development of other blood glands, as of the thyroid gland and spleen, sometimes also a checked involution of the thymus.

The consequences of an extensive hypertrophy of the lymphatic glands we find in the blood, and as such has been observed a peculiar form of leucæmia, caused by an immense compilation of formations, which are analogous to the parenchyma corpuscles (so-called lymph corpuscles); while in the so-called lineal leucæmia (a sequel of chronic tumors of the spleen), we observe in the blood, formations which are analogous to the constituents of the pulp of the spleen. Even in cases of primary hypertrophy of the lymphatic glands which is combined with hypertrophy of the spleen, the developing leucæmia shows more the lymphatic character, so that the parenchyma corpuscles predominate in the blood. (Von Gottschalk.)

In the simply hypertrophied glands there is but a slight alteration of structure. The longer they have existed, all the firmer and denser becomes the substance. The superficial surface, in most instances is very vascular when cut into and compressed, a turbid fluid may be squeezed out, which, under the microscope, exhibits the characteristic granular element, numerous granules, a few cells and some connective tissue fibres. Occasionally smaller and larger cavities, with clear contents, occur scattered throughout the parenchyma of the gland. (Vogel.)

All the glands do not at once swell up, but the disease begins perhaps in an inguinal or axillary lymph gland, and in the first place extends to the collective lymph glands of the region; then those situated farther interiorly, near the thoracic duct, follow perhaps the mediastinal and retro-peritoneal groups; thereafter peripheral glandular groups swell up anew until finally everything that is called lymph gland is more or less tumefied. Individual glands not unfrequently attain three to fivefold, even tenfold, their normal circumference. Nevertheless anatomical examination, in every case shows a simple hyperplastic process. There is nothing that might not also occur in a normal lymph gland; close meshed nets of fine, shining filaments penetrated by blood capillaries and filled up with lymph corpuscles. Only that the cortical tufts and the medullary channels are much broader and the capsules and the connective tissue septa are thicker than normal. (Rindfleisch.)

Treatment.—These indurated glands are often tedious to cure. The food selected should be animal chiefly and as solid as the child will digest. Lilienthal has collected the following remedies with their prominent symptoms, but he has overlooked one of the most important, *Calcarea iod.* [See General Therapeutics].

Ammonia carb.—Swelling of the cervical glands, with itching eruptions of the face and body.

Arsen. iod.—Acute swellings of the axillary and inguinal glands, or of the submaxillary, when they are swollen and threaten to suppurate.

Aurum.—Swelling and suppuration of the inguinal glands, in consequence of syphilis or abuse of *Mercury*.

Badiaga.—Swollen and engorged glands, especially in scrofulous persons.

Baryta.—Swelling, inflammation and induration of the cervical glands, especially when there is dry scurf on the head and

Belladonna.—Inflammatory swelling of the glands ar

vessels forming red and shining strings or cords, with lu the affected parts, tensive and stitching pains; also for swelling, induration or suppuration of the inguinal or cervical glands, and for cold swellings. After *Belladonna* are frequently suitable, *Dulc.*, *Hepar*, *Rhus tox.*, or *Calc.*, *Nux vom.* and *Sulphur.*

Bryonia.—Swelling of the cutaneous glands, forming small hard knots under the skin.

Calcarea.—Swelling and induration of the submaxilly, axillary, and inguinal glands, also of the cervical, parotid, and facial glands, especially when there is otorrhœa and hard hearing. Also for cold swellings, and swellings of the mesenteric glands. *Calcarea* is frequently suitable after *Sulphur.*

Carbo veg.—Induration of the axillary glands and lumps in the breasts.

Chamomilla.—Inflammatory and painful swelling of the submaxillary and cervical glands, and for induration of the mammæ of new born infants.

Cistus.—Swelling and suppuration of the submaxillary glands, with caries of the jaw.

Dulcamara.—Cold swelling, also for inflammation and induration of the inguinal and cervical glands, with tensive pain. *Dulc.* is frequently indicated after *Bell.* or *Merc.*

Graphites.—Scrofulous swellings of the cervical glands.

Hepar.—Suppuration of the axillary and inguinal glands, especially when *Mercury* has been used.

Iodium.—Scrofulous or arthritic induration of the inguinal, cervical, or axillary glands.

Mercurius.—Cold swellings; inflammation, swelling, or suppuration of the submaxillary, axillary, inguinal, or parotid glands, especially in scrofulous or syphilitic individuals. After *Merc.* are frequently suitable, *Dulc.*, *Bell.*, *Hepar*, or *Rhus tox.*

Nitric ac.—Inflammatory swelling or suppuration of the inguinal or axillary glands, especially after abuse of *Mercury*, or in syphilitic subjects.

Nux vom.—Inflammation of the lymphatic vessels, with heat and shining redness, hardness, and painfulness. *Nux vom.* is frequently suitable after *Bell.*

Silicea.—Scrofulous induration and swelling of the cervical, parotid, axillary, and inguinal glands, with or without inflammation.

Spongia.—Scrofulous swelling and induration of the cervical glands.

Sulphur.—Swelling, induration, and suppuration of the inguinal, axillary, and submilliary glands, also of the cervical and even cutaneoues glands, either from scrofula, or in consequence of some cutaneous disease, such as scarlatina, etc.. or from abuse of *Mercury*.

CERVICAL ADENITIS (SCROFULOSIS).

This is the form of disease known as scrofulosis or strumous adenitis. It seems more scientific to choose the pathology rather than one of the supposed causes from which to select the name of this disease of the lymphatics. The term scrofula is becoming obsolete.

The superficial and deep cervical lymphatics are often enlarged and may ulcerate when they have extra duty to perform, as in the reabsorption of a large quantity of serum poured out, as in eczema of the calp, seborrhœa.

The inflammatory process doubtless extends along the lymphatic vessels, and thus reaches the gland. The main seat of these glandular swellings in the cervical region is behind the ears, under the lower jaw and along the course of the sterno-cleido-mastoid muscles and are subject to two forms of inflammation or lymphadenitis — acute and chronic.

In the acute form the parenchyma of the gland is injected, reddened, swollen, soft and friable; its tissue is either uniformly infiltrated by more or less exudation, or in single points or parts in larger quantity; sometimes there are small hæmorrhagic extravasations in the parenchyma. The surrounding cellular tissue takes part more or less in the inflammatory process; it is reddened, infiltrated with a thick exudation and also not seldom the seat of small, bloody extravasations. The inflamed gland at once becomes united with the inflamed and infiltrated cellular tissue. These changes cause the following symptoms: Excessive pain over the gland which is increased on pressure and which is still more intensive when the inflamed gland lies under a tense aponeurosis. The patient in the beginning of the inflammation feels chilly, followed quickly by fever, loses appetite, has a coated tongue, excessive thirst, restless sleep and dry skin. There is local throbbing and beating and the skin becomes redder, the swelling which was hard in the beginning becomes softer on one pl
reddening of the skin on such a place more yellowish a
and finally the abscess breaks. After complete disch

contents the walls of the abscess sink, and heal by adhesive inflammation; at the same time all other disturbances disappear. Yet frequently the healing process is retarded, and particularly so when the opening of the abscess resulted spontaneously and rather late, in consequence of which the epidermis became undermined to a greater degree, and the more or less infiltrated and bloodless flaps of cutis fall off, leaving a space to be filled with granulations. Very peculiar ulcers are sometimes formed, with callous, extuberating edges and lardaceous bases, from which irregular portions of the gland protrudes. Or, the abscess, instead of opening outwardly, sinks deeper to find an outlet at a greater or less distance from its original seat, causing thereby suppuration of cellular tissue, or forming a fistular channel. Under unfavorable external or internal conditions the inflammation of the gland and its cellular tissue can change into mortification. This often results in death under the symptoms of an adynamic fever; or, in more favorable cases, the mortified (gangrenous) cellular tissue and the morbidly destroyed gland with the supervening epidermis, sloughs off and the reproduction of the large loss of substance takes place by granulation. Furthermore, we observe sometimes as a result, induration of the gland, in consequence of the exudation in the gland and cellular tissue, becoming only partially resorbed, while the larger part changes into a fibroid callus. The tumor shrinks gradually to a round, hard and resistant knot, after which no further changes can be noticed.

There are some cases of adenitis which begin in an acute form, with fever, severe pain, etc., but change later to a slow course, or the chronic form.

The chronic form is either the result of the acute, or is chronic from the beginning. A gland, or a group of glands swell slowly and gradually, and without pain, and even by pressure the swelling is without the sensation of pain (indolent); the motion of neighboring parts are undisturbed; no fever accompanies the slowly resulting infiltration; the epidermis over it is unchanged and without a trace of inflammatory hyperæmia. After several weeks, or even months, the exudation may be resorbed, of course, as slowly as it came and the swelling of the gland disappears. Sometimes there is a change of exacerbation and remission, so that the enlarged gland for some time decreases, but in consequence of renewed hyperæmia and exudation, it soon increases to its former volume. Such exacerbations may be caused by colds, faults in diet, bodily fatigue. Most of such tumors of the glands result in a permanent induration, after which no more changes take place.

Occasionally chronic lymphademitis ends in suppuration, the beginning of which is preceded by a lively hyperæmia, larger swelling of the gland and its cellular tissue, reddening of the epidermis and acute pains, yet this process is less rapid here than in the acute form; at times suppuration begins at different points, discharging a thin, watery pus. The closing of this abscess may be retarded, and fistulous furrows, or, open, so-called skin ulcers are formed, after the final closing of which, always remain deep and disfiguring cicatrices. (Von Gottschalk).

The cervical lymphatic glands and cellular tissue of the sides of the neck, are sometimes found to be swollen during the course of scarlet fever. This seldom takes place to any considerable extent *prior* to the third or fourth day. The enlargement generally disappears, in favorable cases, in from three to twelve days, by resolution, while in others it terminates by suppuration of the glands and surrounding parts. (Meigs & Pepper).

The *treatment* for this form of derangement of the lymphatic system will need to be both hygienic and remedial. Warm baths must be avoided as well as frequent bathing. The child should have much exercise in the open air. The food should be animal chiefly. These children as a rule eat large quantities of food, and prefer starchy articles. They also drink much water. They should drink very seldom. With activity, diversion, animal food and little water, they will lose flesh, and at the same time the overtaxed lymphatic reabsorbents about the neck will also rapidly diminish in size. When the glands are enlarged from sores on the head, these must first be cured as the glands will usually shrink because of less functional activity. Sometimes these glands are hypertrophied in very lean children, in such cases we will find the absorbent or mesenteric glands also similarly affected.

The remedies that bear directly on this form of disease are: *Arsenicum*, *Baryta carb.*, *Belladonna*, *Calcarea carb.*, *Conium*, *Hepar*, *Iodine*, *Lycopodium*, *Mercurius*, *Nitric acid*, *Phosphorus*, *Rhus tox.*, *Sulphur.* Jahr mentions *Sulph.*, *Calc.*, *Lyc.*, and *Silicea;* also *Ars.*, *Aurum*, *Baryta*, *Dulc.*, *Hep.*, and *Carbo veg.*

The following are some of the leading indications:

Arsenicum.—Great emaciation; waxy paleness; great fatigue on the least exertion; nocturnal restlessness. Can hardly go up stairs. Scrofulous atrophy.

Baryta c.— Painful glandular swellings and indurations in the neck or near the articulations of the lower jaw. The mesenteric glands become affected, and atrophy commences to show itself.

Belladonna.— Bleeding of the nose; distended abdomen; the throat frequently becomes sore; the eyes are often inflamed; bloated face; no good sleep; hears all that is going on at night.

Calcarea c.— Head large; fontanelles open, or are unusually slow in closing; much perspiration about the head. Sympathetic swelling of the neck and in other places; enlargement of the abdomen.

Cina.— It is not a little remarkable, and a fact that disproves many theories of Old School origin, that *Cina* so often cures scrofulosis in children who are continually boring with the fingers in the nose, who are cross and exceedingly unamiable, whose urine turns milky on standing, whom nothing pleases, who are constantly turning and twisting at night, with frequent calls for water, and who are often ravenous for food.

Hepar.— Is also suitable in many cases, as indeed are many other remedies, according to their characteristics. Compare rachitis.

Iodine.— This remedy is very frequently indicated when there are glandular swellings. Compare all the symptoms. *Bromine* is closely allied to *Iodine.*

Mercurius sol.— Cold and clammy sweat upon the lower extremities at night. Night sweats; swollen and inflamed glands, with tendency to ulceration. Salivation, scorbutic gums. All the symptoms are always worse in cold damp weather.

Mezereum.— May be indicated where there is constant excoriation of the nose, and often of the throat.

Psoricum.— In many respects this remedy is similar to *Sulphur.*

Silicea.— Useful in children with large bellies, weak ankles, much perspiration about the head, and inclination to uncover.

Sulphur.— In children who are exceedingly sensitive to the open air or wind; they do not like to be bathed, to touch water, to have their hair combed or brushed, or made to look nice. Skin rough and scaly. Burning heat in the soles of the feet; short naps of sleep at night; papular eruptions.

Consult also the remedies under Hypertrophy, General Therapeutics, etc.

BRONCHIAL LYMPHADENITIS (TUBERCULOSIS.)

Under this head we shall treat what is usually called tuberculosis. The cheesy masses are found in all lymphatic glands when indurated.

When these glands enlarge to a certain degree, there is developed the signs of pressure upon blood vessels, nerves, and air passages. Pressure upon the superior vena cava or either innominate vein, interferes with the return of the blood from the head and neck. As a consequence there is dilatation of the veins of those parts and more or less lividity of the face, neck, and upper part of the chest. A certain amount of heaviness and stupor may be produced by the interference with the return of blood from the brain; and, if the pressure be great, or the quality of the blood much impoverished, puffiness, or even œdema of the face may be found, first appearing and being most marked about the eyelids. If only one of the innominate veins is exposed to pressure, the symptoms are limited to one side only. Enlargement of the veins of one side of the face and neck, with a prominent jugular vein on that side, should always lead to a suspicion of these glands. The venous engorgement is especially noticeable during coughing. If the congestion is very great, rupture of small vessels may take place, and bleeding take place from the nose or into the lungs. The former is common, but the latter is difficult to ascertain, for children almost invariably swallow blood coming up from the lungs. In a child the discharge of blood from the mouth during coughing is seldom evidence of hemoptysis. It is almost always the result of epistaxis, the blood flowing down into the back of the throat through the posterior nares.

When the nerves passing through the chest are compressed, one of the earliest indications of such pressure is a peculiar character of the cough. The cough becomes spasmodic, occurring irregularly in paroxysms like those of pertussis, lasting only a short time, and ending sometimes, though rarely, in a crowing inspiration. There is seldom any vomiting. Sometimes the cough is hoarse and dry; at others it is moist with a rattling of mucus; at others again its quality is unchanged and presents nothing to attract attention. The voice, like the cough, may be altered in character, but not usually, unless the disease is far advanced. It may become hoarse or thick, or even partially extinct, and these different conditions frequently alternate with one another. Violent attacks of dyspnœa occasionally occur, and may assume all the characters of asthmatic seizures; the face becomes livid, the countenance anxious, and the skin cool and damp. Asthma in young children not unfrequently owes its origin to this condition of the bronchial glands. Attacks of spasms of the glottis sometimes are noticed; according to Dr. Ley, laryngismus stridulus is constantly produced by this cause. Softening of the enlarged glands may take place, and a communication be set up with the lung, producing pneumothorax or with a large vessel, giving rise to fatal hæmorrhage. These methods of termination are, however, rare. (Eustace Smith).

Treatment.— The medicines which meet with most general commendation in the treatment of enlarged lymphatic glands are *Sulphur*, *Calcarea*, and *Silicea* in one class; *Rhus*, *Dulcamara*, *Mercurius*, and *Conium* in another. The first three are considered most suitable when the lymphatic diathesis is well marked; the latter when a local affinity for the glands is chiefly desired in the remedy. Also *Iodine*, the *Iodide of Potassium*, *Biniodide of Mercury* and *Iodide of Calcium*. (Hughes). Teste commends *Rhus*, following it with *Mercurius* and *Sulphur*. Hartmann suggests *Cistus canadenses*.

TABES MESENTERICA, (ENTERITIS FOLLICULOSA) ATROPHY.

The mesenteric glands are situated in the folds of the mesentery, and are the organs through which the chyle must first pass, on its way to the general circulation. Any change taking place in them, must therefore be of most serious import. The transition of intestinal catarrh into the disease under consideration is one of very frequent occurrence and should be borne in mind both in a prognostic and therapeutic point of view.

The most recent histological investigations have shown that, in addition to the ordinary well known lymphatic glands, which are of certain size, a great number of smaller apparatuses exist in the body which possess precisely the same structure, but do not exhibit such a complex arrangement as we find in the lymphatic glands. To this class belong above all, the follicles of the intestine both the solitary and Peyerian. A Peyer's patch is nothing more than a lymphatic gland spread out as it were upon the surface; the individual follicles of the digestive tract, correspond to the individual follicles of a lymphatic gland, only that the former, in man at least, are disposed in a single layer, the latter in several. The solitary and Peyerian glands have therefore nothing at common with the ordinary glands which pour their secretions into the intestinal canal; on the contrary, they rather hold the position, and manifestly also fulfill the functions of lymphatic glands. To the same category belong in all probability also the analogous apparatuses which we find grouped together in such large masses in the upper part of the digestive tract, where they form the follicles at the root of the tongue and tonsils. Whilst in the intestine the follicles lie spread out on an even surface, in these parts the surface is inverted and the individual follicles lie around the convoluted membrane. (Virchow).

Pathological Anatomy.— The submucous tissue is found markedly infiltrated, so that the bowel has perceptibly increased, and the signs of an acute intestinal catarrh are present upon the entire mucous membrane of the large, and upon an extensive tract of the small intestines, *i. e.*, instead of the normal cylindrical epithelium, none but mucous corpuscles are seen. The solitary glands and Peyer's patches are in some parts intensely swollen, and at the first glance are seen to project like white nodules above the level of the mucous membrane; in other parts, however, they are already ruptured and then represent empty, minute, crater-like excavations. These excavations occur upon the summits of the elevations originally produced by the swelling of the follicles. The mesentery is injected and turgid, the chylopoetic vessels are plethoric, and of a pink color; the mesenteric glands in those regions corresponding to the intestinal catarrh are increased in size from two to four-fold; in recent cases, when cut into, the incised surface presents a rose color, but when of longer duration, a yellowish-white color. Here, too, as in simple intestinal catarrh, notwithstanding the long existence of the diarrhœa, remarkably little pigmentation of the mucous membrane is found. The essential anatomo-pathological difference between intestinal catarrh and enteritis folliculosa consists in the circumstance that in the latter the mesenteric glands participate in the disease. It is much to be regretted that neither by injections, nor in any other manner can it be experimentally proven that the absorption of the chyle is hindered by these hypertrophied mesenteric glands, and thereby the nutrition and progressive development of the child interfered with. But when in an atrophied child, whose condition was originally induced by enteritis folliculosa, no changes but those indurated and hypertrophied mesenteric glands are found, the supposition becomes very probable that the passage of the chyle has been mechanically interrupted, and thus the children, although they have consumed an enormous quantity of food, and have had no diarrhœa, for weeks preceding death have nevertheless languished to a certain extent for want of a sufficient supply of chyle. The term tabes mesenterica of the older physicians is therfore by no means so incorrectly founded and obsolete as some of the later writers are inclined to represent it. The older erred only in this, that they thought they could feel the enlarged glands. In this glandular hypertrophy the intestines always become tympanitic and distended, and then it is altogether impossible to feel these small tumors, which scarcely ever attain to the size of a hazelnut, between or beneath the tense bowels. At any rate they must be compressed against the vertebral column, if it is desired to feel them. In instances of induration (tuberculosis) of the mesenteric glands, as it sometimes occurs in children several years old, the firm, hard, solitary tubercles may indeed be felt through the abdominal walls. But these are larger glands agglomerated into patches and masses and traversed by deposits of cheesy lymph. Such slight enlargement as is observed in enteritis folliculosa can never be detected during life by the sense of touch

Symptoms.— Enteritis folliculosa always begins with intestinal catarrh, (see Vol. I., p. 389, and consult the chapter on diarrhœa, p. 384 *loc. cit.*) But instead of the stools becoming semi-solid in a few days, and the nutrition regulated as in simple intestinal catarrh, they remain perfectly liquid and assume a putrid, foul odor, corrode the anus and its adjacent parts, the inner surfaces of the thighs, and even the heels which are brought in contact with the anus by contractions of the thighs and legs. An intense continuous fever becomes superadded, and the patients have a constant and severe thirst. The tongue is red and smooth, or coated with a white fur, and in the latter stages of the disease, almost always affected with thrush. Vomiting is frequent, but not present in all cases. Rapid emaciation is characteristic of the disease. In previously perfectly healthy, well nourished children ; small wrinkles are soon observable on the inner surfaces of the thighs ; and the adipose tissue, that was previously firm and solid, is now felt to be soft and flabby. Under the continuation of this putrid diarrhœal discharge, emaciation progresses so rapidly that at the end of a few days, the bones of the hands and the feet plainly show their outlines, and the integument on the thighs forms loose, flabby folds. On both sides a collection of inguinal glands may now be detected, which also swell up to twice or thrice their normal size. The eyes are sunken, a deep fold forms from the inner angles to the zygomatic arches, the cheeks become pale and flabby, the contours of the masseters distinguishable, the chin pointed, the neck wrinkled, the sterno-cleido-mastoid muscles and larynx prominent, the ribs can be counted without being touched and the vertebral column and bones of the pelvis are covered with atrophic skin only.

A very peculiar phenomenon may be observed on the occiput. The superior border of the occipital bone shoves itself beneath the border of the parietal bones, thus forming a step, the upper plane of which is formed by the parietal bones and the lower by the occipital bone. Exceptionally the occipital glides over the parietal bones. A similar but less striking displacement takes place at the frontal bones, the superior borders of which slide beneath the parietal. The diminution of the cavity of the skull is caused by a decrease in the size of the brain, for this organ participates in the general atrophy, and since it consists in greater part of fat, it must, therefore, also suffer a decided loss of this material. So far as we are aware, there is no quantitative chemical analysis of the brains of *atrophic* children to be found, it is only known that the brains of young children in general, are poorer in fat than those of the adult. If the bones of the cranium have once overridden each other, and cerebral atrophy has become superadded, an improvement is only to be looked for in the rarest instances; the patients almost always waste away more and more and invariably perish, although they may have had no diarrhœa for weeks, the stools however retain a putrid odor, and the appetite remains to the last.

From this atrophy of the brain a long train of cerebral symptoms results. There is to be found in the abdominal integument one of the best indices as to the degree to which the atrophy has reached. If pinched and raised into a fold it remains for some time after the fingers are removed, the prognosis always, and under all circumstances is to be regarded as most unfavorable; the prospect of recovery always improves in proportion to the rapidity with which a fold of the integument thus produced disappears.

In atrophic children with tympanitic abdomen — a condition which in fact is usually present in atrophy, as a result of enteritis folliculosa — small, solitary tubercles of the size of pin's heads are seen upon the abdominal integument, united to each other by very fine cords, and only recognizable by the feel. These cords are not plugged up veins, because veins, when the integument is so atrophied, and in such a superficial position, would appear bluish or black. They can be only obliterated veins, or, what is still more probable, lymphatic vessels — a supposition which may serve to explain the character of the small nodules. (Vogel).

Food may be often noticed in the stools, either in a half-digested form or wholly unaltered, indicating the condition known as lientery (lienteria); and a very distressing symptom is sometimes met with in the form of extreme gaseous distension of the intestines. As the disease advances, general anasarca or ascites usually set in.

Prolapsus of the rectum and incontinence from paralysis of the sphincter, diphtheritic exudation, gangrenous ulceration, follicular dermatitis, dysentery and hydrocephalus, are some of the many complications to which patients suffering from this disease are subject.

The appetite is only sometimes impaired and that transiently, for the child often continues to take an amount of nourishment quite out of harmony with the daily increasing emaciation. The thirst is not usually so distressing a symptom as in acute intestinal catarrh. (Steiner).

Treatment.— This is partially dietetic, partly therapeutic. The food will require to be carefully selected. It must be unirritating, easily assimilated and that will find its way into the circulation via the capillaries. Beef tea, whey, egg-tea, well cooked starchy food. Milk rich in casein and fat, will as a rule not be assimilated. Minced raw meat sweetened or salted or both, sometimes will be taken and will nourish, especially in older children and during the second summer. One case almost at death's door, took kindly to the beef pulp and lived on it for two weeks, then starchy food was gradually added. Another case that would take nothing, was nourished by the skin, by rubbing it every night with sweet oil and gradually omitting it as the appetite returned. In case of relapse the oiling was resumed. It should be kept quiet after feeding and coaxed to sleep if possible. This may be best accomplished by carrying the child into the open air. These children are usually most quiet when out of doors. If possible they should be taken to the lake or river where the air is moist. The cool of the morning and evening is the best time to take them out of doors. Unless the sun is very hot they may be taken on the water at any time of day. Carriage riding soothes such wasted children and thereby helps absorption. A thin flannel band should be worn about the bowels constantly, as these children are very sensitive to changes. The more emaciated the warmer should be the water used in bathing. Avoid shocking the system by cold bathing—or sudden movements, as there is so little blood that the child may faint and never recover. The head should be kept on a level or even lower than the body, in very bad cases.

Therapeutics.—Hughes considers *Iodine* to be a remedy of the greatest importance in this disease; he also says that *Arsenicum* is of great temporary service, but that it has no curative power over the entire disease. *Calcarea* is also of service, and Dr. Kidd recommends *Mercurius cor.* where there is evident inflammation of the glands, previous. Teste commends *Sarsaparilla* 18, *Aloes* 6, and *Colchicum* 12, in succession.

Dr. Valentine, of St. Louis, depends upon *Mercurius*, *Arsenicum*, or *Calcarea*. With these he has cured all the cases treated.

Hartmann says, *Sulphur* is indicated by the following symptoms: Craving appetite with hard, distended abdomen, at times slimy diarrhœa, at others constipation; a peculiar old-looking expression of the countenance, with a livid, wrinkled skin; sleeplessness; cutaneous eruptions, such as scurfy vesicles, rash, red pimples, rhagades, etc.; constant running at the nose, as in catarrh; the child has an unnatural temperature, with constant disposition to sweat. It is likewise, indicated when the disorder originates in syphilitic or mercurial cachexia, and *Mercurius* and *Hepar* were unable to complete the cure.

Æthusa cynapium.—The child throws up its milk soon after nursing with great force, suddenly, then falls asleep as if from exhaustion, to awaken for a fresh supply. Milk seems not to agree with the child which is shown by colic, diarrhœa, or constipation; it does not thrive. Aphthous condition of the mouth and throat.

Aloes.—The child passes substances looking like jelly-cake, sometimes small, at other times large, but they adhere together like congealed mucus; they may be green colored or transparent.

Alumina.—The child strains greatly to evacuate even a soft stool; soreness of the anus; colic; the child wastes away.

Antimonium.—Violent and persistent vomiting, with white coated tongue and absence of thirst.

Apis mel.—Violent shrieking spells at longer or shorter intervals; no appetite; emaciation; white and wax-like skin; scanty urine; swelling of the feet and ankles, of transparent whiteness.

Argentum nit.— Diarrhœa of green fœtid mucus, passing off with much flatulency.

Arnica.— The infant has had a shock from a fall, and has not been well since; it becomes feeble and emaciated; does not sleep well, is restless, but no appetite, and is in great distress after eating.

Arsenicum.— The stools are painful, offensive, and contain quantities of undigested food; there is much debility, and a pale, waxy look. The child is restless, especially after midnight; it seems to be cold and chilled.

Baryta carb. is another excellent remedy, characterized by distension of the bowels, glandular swellings, mental and nervous debility; or when the children are unable to go to sleep at night, their sleep is restless, they like to be eating all the time, but have an aversion to sweet things and fruit; they cannot eat much at a time, in spite of their craving hunger, and are satiated after eating but little; during the meal they are suddenly attacked with languor and sudden urging to stool, with violent pains around the loins; their hair falls out, they have a dry scurf on the head, sometimes on the cheeks; scurfs in the nose.

Baptisia.— The infant has almost constant diarrhœa; chokes on attempting to swallow anything not very fluid; it cannot swallow anything but fluids.

Belladonna.— Especially suitable for precocious children having blue eyes and fair hair. The child does not sleep much, though appearing to be drowsy; it lies half sleeping and half waking; moaning; jerking of the muscles.

Benzoic acid.— The urine has a strong ammoniacal odor, and leaves a dark stain on the diaper; the diarrhœic stools have an odor similar to that of urine.

Borax.— The child dreads a downward motion; is easily startled by the slightest noise; aphthæ; sleeps badly, and awakens with screams as if in affright, and clings to something as if afraid of falling.

Bryonia.— The food is vomited immediately after being taken; constipation; the lips are dry and parched, and the whole mouth is dry; the child wishes to be kept at rest, and prefers the recumbent posture; it becomes worse at every hot spell.

Calcarea carb.— This remedy is indicated at a later period of the disease, and when in addition to the symptoms of *Sulphur* there is swelling and hardness of the mesenteric glands, emaciation, excessive debility, which is increased by the frequent diarrhœic, clay-colored discharges from the bowels; the skin becomes more and more dry and withering; the scalp looks sickly, and the hair which grows out of it, is dry and looks as if dead; the nervous system becomes very sensitive, palpitation of the heart supervenes, together with other symptoms which seem to forbode a fatal termination. There is also under *Calcarea c.:* Large, open fontanelles; much perspiration about the head in large drops, which wets the pillow far around when the child is sleeping. Cough, with rattling of mucus in the bronchi. Leucophlegmatic temperament.

Chamomilla.— The child must be carried all the time, for it is quiet only then. Diarrhœa, green, watery and slimy, or like chopped eggs and spinach. Odor like decayed eggs. One cheek red and the other pale.

Chamomilla, China, Bryonia, Pulsatilla, Nux vom. Phos ac., Ferrum, are to be compared: *Chamomilla* where there are diarrhœic stools of a green color, or resembling stirred eggs, or having a sour smell; at times the child is attacked with sour vomiting, or, if somewhat advanced in age, has an insatiable craving for food or for things which it must not have; for this same canine hunger, *China* also is useful. *Bryonia* and *Nux* were of avail when the food was thrown up again immediately, and there was constipation rather than diarrhœa. *Pulsatilla* when diarrhœa is present. *Ferrum* where there is vomiting of food, *Phos. acid* when the diarrhœa continues and is attended with debility and exhausting morning sweats.

China.— Offensive, painless, undigested stool, with flatulency; abdomen distended with flatulence; the child cries when it is touched.

Cina.— The child picks its nose very much; is very restless, cries and is very unamiable, it is hungry and wants food all the time; it wants to be in constant motion — to be rocked all the time when sleeping, and will not sleep without it. Nothing pleases the child for a moment.

Conium.— Hardness and distention of the abdomen, with frequent and sour evacuations; is worse during the night and better by day.

Creasote.— Fœtid evacuations and excoriations of the mucous surface generally; restless and sleepless; the skin is wrinkled.

Ferrum.— Stools undigested; redness of the face; the child is very delicate in appearance.

Graphites.— The child has moist blotches on the skin that exude a transparent, glutinous fluid; chaffing back of the ears; diarrhœa or constipation.

Hepar.— The child has a sour smell, and white, fœtid evacuations; undigested stools; seems to be better after feeding; does not incline to play or to amuse itself in any way; does not laugh.

Iodine.— A brown color of the face, and copious and papescent stools; seems to be better after eating.

Ipecac.— Nausea is the most prominent symptom, with frequent vomiting; fermented stools.

Lycopodium.— Much commotion; much rolling and rumbling in the abdomen. The child is worse after 4 P. M., and gets better at eight or nine in the evening. Red stain or red sand on the diaper.

Magnesia c.— Green, watery, very sour smelling diarrhœa, and great emaciation; stools of green slime, like the scum from a frog pond.

Mercurius.— Much straining at stool, which is slimy; often bloody. The child is never so well during damp weather. Enlarged glands; night sweats.

Nux v.— Constipation of large, difficult stools; no appetite; does not sleep after three or four in the morning.

Oleander.— The food passes off unchanged in a marked degree, and very easily and almost unconsciously.

Opium may be indicated in cases reaching the stage of coma. *Opium* and minced raw beef saved one case that could have lived but a few hours. See also General Therapeutics.

Petroleum.— Emaciation, with diarrhœa by day, and none at night.

Phosphorus.— Copious stools, pouring away like water from a dydrant, followed by exhaustion.

Phosphoric acid.— Stools yellowish and very offensive, and the child is very listless — wants nothing and cares for nothing.

Podophyllum p.— Emaciation; many stools daily, all of which are natural. Diarrhœa in the morning.

Pulsatilla.— The diarrhœa is worse at night; no two stools alike, they are so changeable. For a time the child seems much better, then it gets worse again without any appreciable cause. The appearances of the child changes in this manner several times during the same day, but it is usually worse towards evening, and always seems better in the open air.

Rhus tox.— Where there is an alternate craving for food and indifference to food or drink, and there are slimy discharges and colic more frequent after midnight. This remedy responds not only to these symptoms but to the morbid condition of the mesenteric glands.

Rhus tox.— The child always gets particularly worse after twelve o'clock at night; it has then more colic, more diarrhœa, more restlessness.

Stannum.— The child is always relieved in its abdominal sufferings by pressing hard upon the abdomen, leaning upon something.

Sulphur.— The child frequently awakens from sleep with screaming; great vorocity; wishes to put everything into its mouth that it sees; watches eagerly for everything—cups, tumblers, vessels of food; it wants to swallow everything that it sees. Its passages excoriates the anus. The child jumps and starts, and screams vialently.

GENERAL THERAPEUTIC HINTS.

For the following excellent analysis of the remedies bearing on atrophy, etc.; we are indebted to Dr. Farrington, of Philadelphia, to which we have made a few additions:

Sulphur is characterized by emaciation; the skin is dry, harsh and wrinkled; giving the child an "old man" look. The body has an offensive odor, not removable by washing. Eruptions are chiefly eczema capitis, generally dry, easily bleeding; itching more at night; scratching relieves, but causes bleeding; excoriations; intertigo, especially at the anus. Glands swollen, particularly the cervical, axillary and inguinal. Appetite voracious; child eagerly grasps at everything within reach and thrusts it into its mouth. Abdomen distended and hard, constipation or diarrhœa slimy, green, watery, changeable, worse at night; sudden urging wakens him in the morning, followed by copious watery stools. If hydrocephaloid sets in, the child lies in a stupor, its face pale, lower jaw dropped, eyes half open, and forehead covered with cold sweat. The urine is suppressed and there are frequent muscular twitches. In less severe cases the child is restless at night; sleeps in "cat naps;" awakens often screaming or on going to sleep is annoyed by sudden jerking up of the limbs. At other times an almost unbroken fever obtains, the skin for days remaining dry and hot. The child is cross, obstinate; cannot bear to be washed or bathed. Its face is pale, sunken, with deep and hollow eyes. Dentition is slow; muscles and bones develop very tardily, so that a year-old child looks scarcely larger than a new-born babe. Complains of fatigue every little while; sits bent forward, refuses to stand long, but crawls and runs about.

Calcarea carbonica is very similar. The emaciation is more marked in other than adipose tissue. There are atrophy of muscles, soft bones, retarded teeth, all evidences of defective nutrition, and yet an excess of fat gives a deceptive appearance of plump health. When wasting shows itself in fat too, the body dwindles, the pale skin hangs in folds, but the abdomen seems to remain disproportionately enlarged. Partial sweats are more prominent than in *Sulphur*. The scalp is covered with a cold sweat; the knees are clammy; the feet feel damp and cold. The eruptions, especially crusta lactea develop on the face, or quickly spread thence; crusts are dry or yield a mild, thick pus. At times they appear isolated and look like ringworm. The child's scalp seems thin, thin blue veins show distinctly, and the little one scratches its head on awakening. The glands are engorged, particularly the mesenteric. Appetite is voracious, yet emaciation persists. Morbid appetite for indigestible articles of food. The child is thirsty and feverish every afternoon. The stools are green, watery, sour, or pungent, or clay-like, and worse in the afternoon; or again creamy, fetid, frequent; urine strong, fetid, clear. If hydrocephaloid sets in, the child is dry or bathed in cold sweats. The fontanelles are open and sunken; the face is pale and pinched, the child frequently scratches at its head; cries as if hurt when lifted from the cradle. The stools are white and slimy and the urine is clear, but very strong smelling, fetid, and is passed with difficulty. Vomiting is very marked in both remedies, but with the *Lime* it is principally sour food, lumps of curdled milk; with the *Sulphur* it is sour, watery, fetid. The differences are only in degree, curdled milk more frequently calling for *Lime*. The child is obstinate, self-willed, cross before stool, and faint after. Its face is pale, bloated or sunken and emaciated, looking like a tiny doll. At other times it is more like *Sulphur*, old and wrinkled and cold. Growth is retarded; the child though old enough, will not put its feet to the ground. Spine seems weak, it sits stooped. The legs are often curved and the bones can be bent quite readily. While the *Sulphur* child dreads washing, the *Calcarea* patient has less dread, but is made worse by bathing.

Calcarea phos. has numerous similarities with both the foregoing. It is distinguished by the following: Complexion is sallow; the whole child is emaciated and poorly developed; the posterior fontanelle is also very large, showing greater nutritive defect than in the carbonate. The abdomen is shrunken and flabby. The stool is watery, hot, or green, slimy; passed with much offensive flatus. The child is attacked with pain as soon as it eats. When lifted, breathes short, has an anxious look. If hydrocephaloid ensues, the child is exhausted and limp, its slender neck refuses to support the head, the fingers are all skin and bones. The child craves food, is greedy like *Sulphur* and *Calc. c.*, but while the latter longs for eggs, the *Calc. phos.* craves salt meat, bacon, etc.

Calcarea iod. is to be preferred to other lime salts, when the child, though looking plump and healthy, shows well defined scrofulosis, with thick, scabby eruptions, otorrhœa and engorged glands and enlarged tonsils.

Hepar necessarily resembles *Sulphur* and *Lime.* Under an apparent plumpness the physician detects that the flesh is flabby, the muscles withered and the digestion weak. The child is intolerant of pressure about the stomach after eating. Food seems to temporarily relieve the debility. If the child were old enough, he would describe the feelings as one of invigoration, like a stimulant in the stomach. The stools are green, watery, undigested, or white, sour smelling and painless, and worse during the day. There is little tendency to cerebral symptoms. The glands are swollen, and the child is subject to catarrhs from the least draught of cool air. In dry, cold, windy weather, croup develops. It has eczema, which is worse in the morning, when it itches, burns and smarts.

Silicea again changes the picture. The whole body is wasted, while the head is exceedingly large. The face is earthy or waxy pale, and the bones are diseased. Pain in the sternum and lumbar spine; rhachitis. The eruptions are prone to ulcerate or suppurate. Small pricks or cuts fester. The toe nails fester and grow into the flesh. The crusta lactea is moist, oozing and is worse from scratching. The appetite is often lost with an especial aversion to the mother's milk, which even if taken is at once vomited. The stools are watery and offensive, or the child is costive. In hydrocephaloid there are, rolling of the head, suppressed urine and great weakness. Electric changes, such as an approaching thunder storm, depress the child and cause extreme prostration. The child is nervous, irritable, susceptible to mental impressions, however sluggish may be its scrofulous symptoms. It is susceptible and timid. The whole head is covered with a sweat and the forehead often becomes cold. This, however, is quickly relieved by wrapping the head warmly. Like *Sulph.*, *Calc.* and *Hepar*, the skin readily ulcerates and refuses to heal. *Hepar* is distinguished by the soreness and tenderness of its ulcers and eruptions.

Phosphorus exhibits emaciation, combined with nervous debility. Brain and spine have suffered severely. The child is over-tall, but slender, emaciated but big bellied; face pale, almost waxen. Delicate eyelashes, soft hair and rapid breathing indicate what belongs to the sequel. Even thus early the diarrhœa is associated with dry cough. The child, however, shows well-marked nervous excitability. He is irascible, vehement, which results in tremor and weakness; he is susceptible to external impressions and so also to electric changes in the atmosphere. Glandular swellings, suppurations and caries are similar to those in *Silicea.* The appetite is good; he craves cold food, cries when he sees ice cream, etc., often awakens at night, hot and restless, and will drop off at once to sleep if fed. The stools are green, watery, bright-yellow, undigested, hot, involuntary, coming out with force, worse mornings. Stools often contain little particles looking like tallow. Vomiting accompanies the diarrhœa; longs for cold water, but ejects it so soon as it becomes warm in the stomach. Hydrocephaloid may ensue. The face is hippocratic, with sunken eyes surrounded by blue rings. The tongue is dry; the pulse thready; breathing quick; the child lies half comatose.

Petroleum stands between *Sulph.* and *Phos.* on one hand, and the carbons on the other. It has emaciation, irritability; the child is vehement, susceptible to electric changes (like *Phos*,), sudden urging in the morning, followed by profuse watery stool, (like *Sulph.*) and eczema, excoriations, cracked, bleeding rhagades, (like *Graph.*, *Carbo. veg.*, etc.) Its individuality, however, is maintained by the periodicity of the diarrhœa, stools only during the day, and by the colic arousing from sleep in the morning, relieved by bending double. Hunger after stool. Its gushing stool and eruption make it a concordant of *Croton tiglium.*

Iodium causes rapid emaciation, even though the appetite is inordinate. The child is restless, and continually desires to change position. The face is brownish or sunken. It is especially useful in enlarged mesenteric glands, with the above symptoms, and with intolerable irritability; the child will be approached by no one. Glands are swollen and painless; goitre.

Lycopodium produces emaciation. The abdomen is bloated while the limbs are wasted. The face is earthy, with blue rings around the eyes. At other times it is wrinkled. Eruptions are well described. The crusta lactea is thick, cracked and bleeds, and emits a mousy smell. Tendency to capillary bronchitis. The appetite is inordinate, but food soon produces a fulsome feeling, so the child begins hungry enough, but soon desists, and the abdomen seems distended, with much rumbling of wind, especially in the left hypochondrium. The child belches and is soon hungry again. The region of the stomach is distended and intolerant of any pressure, especially after nursing. The urine deposits a red sediment, or is suppressed. Sleeping is disturbed by frequent awakenings. The child springs up in bed, seemingly frightened, knows no one, pushes every one away angrily. The *Lycopodium* patient is weak with well developed head, but puny, sickly body. When sick the child is irritable, nervous and unmanageable. After sleep he is cross, kicks or scratches at anyone who approaches him.

Psorinum stands forth as an ally of *Sulphur*. There are great debility and sweat from any exertion. The skin has the same irremovable odor that distinguishes *Sulphur*. The eruptions are well described. Crusta lactea forms on the face and scalp, appearing prominently down over either ear and cheek. It exfoliates numerous scales, or cracks and discharges a yellow, fetid humor. Boils form on the scalp, which looks dirty and emits an offensive odor. The body itches intolerably at night, worse in the warmth of the bed. The child is pale, sickly, emaciated; nervous, crying out at night as from bad dreams; all medicines fail to relieve. The stool is distinctive, watery, brown or black, horribly offensive, worse by night. The child is worse when the weather changes.

The *Antimonies* have a place here, by reason of their resemblance to *Sulphur*, and because they are well adapted to scrofula, diarrhœa, etc. The child may look fleshy and well, but is subject to gastric catarrh. The eruptions are pustular (especially the tartrate); or develop thick horny crusts, (crudum). In the latter drug we find the nostrils and corners of the mouth covered with crusts, which crack and bleed.

The tongue in *Antimonium crudum* is white; the babe vomits sour, curdled milk as soon as it takes the bottle. Vomiting of food and drink as soon as taken. After nursing, the bowels move. Stools watery, containing fecal lumps, or costive, the stools being white, dry, irregular or hard, lumps of curd; marasmus. The *Antimonium tart.* patient has nausea and retching, with vomiting, sweat on the forehead, afterwards languor, sleep. The stools are brown-yellow, fecal, watery, profuse, with sharp cutting colic. There are frequent jerks of the limbs during sleep. In temperament the *Antimonies* display marked irritability; the child will be neither touched or looked at.

Antimonium crudum is adapted to complaints arising from the heat of summer. While in *Sulphur* all bathing aggravates; in *Antim. crud.* it is particularly cold bathing which cannot be borne. The gastric symptoms and intolerance of summer heat place *Antim. crud.* with *Bryonia.* But the tartrate favors more *Veratrum alb.* (See Bell on Diarrhœa.)

Borax, reserved from the nurses who gave it no higher function than that of a wash, takes a useful place in our list of remedies. The child grows pale, relaxed, flabby, cries, loathes the breast, and falls into a heavy sleep. The head and palms of the hands are hot, the face is pale, clay-colored. Impaired nutrition is shown in the hot mouth and aphthæ on the tongue and cheeks, bleeding when rubbed. When awake or not sound asleep the child is nervous, startled by sudden noises, as thunder, distant cannon firing, etc. When rocked or lowered into its bed, it screams as if affrighted. It can bear no downward motion. Every attempt to nurse causes screaming. The stools are light-yellow, slimy, green, consist of small pieces of yellow feces, or are painless, or as if fermented, thin, brown, smelling like carrion. Dr. Bell refers to the danger of mistaking *Borax* for *Belladonna.* Both have screaming out and starting from sleep, with tossing about, but only *Borax* has the fear of downward motion and the aphthous mouth.

Sepia bears some resemblance to *Borax*, as indeed it does to all soda compounds. The child wastes rapidly, eyes are sunken, palms and soles burning hot. During dentition the child cannot take any milk, especially if boiled. The stools are green and painless; the child awakens frequently, especially wakeful after 3 A. M. Possibly suitable to females. Moist scabs on the scalp; forehead rough.

Sarsaparilla is of great service in those cases in which the child soon wastes away and looks like an old man, and the skin hangs in folds. Eruptions are prone to appear in the spring, their bases are inflamed, the crusts detach readily out of doors, and the adjoining skin becomes chapped. On the forehead the crusta lactea is thick, becoming moist when scratched. Herpes and offensive sweat about the genitals, as in children of sycotic parents. The child becomes very restless and uneasy, screams before passing water, afterward the diaper is found covered with a white sand. The stool is accompanied with much flatus, and is often followed by fainting.

Graphites is selected by its skin symptoms principally. Like in all the carbons the discharges are apt to be offensive. Thus breath, stools, urine, sweat, all are offensive. The diarrhœa is brown, thin, fetid, mixed, containing half digested food, or watery and scalding, or composed of white mucus, which, also coats what fecal matter passes. The child is impertinent and laughs at reprimands. It has a harsh, rough skin disposed to chafing. Eczema capitis forms thick, dirty crusts, which ooze a glutinous humor, matting the hair. The eyelids thicken, their tarsi thicken, crack and bleed; crusts form in the nose, with soreness and oozing; a gluey discharge oozes from a raw surface behind the ears. The groins become sore and the inguinal glands swollen. Best adapted to fair plump children who look like the typical *Calcarea* child, but with well marked skin symptoms.

Carbo veg. is generally called for late in the disease, when the vital powers are failing and there is little or no reaction to well-chosen medicines. The skin is cold, pale or blue, the face having a greenish hue. The child may have an anxious look, but it is too lifeless to move or exhibit much restlessness. The breath may be cold and the pulse weak and rapid. The stools are dark, thin and cadaverous smelling. Useful in protracted sultry weather, when the days are hot and damp.

Arsenic steps in here as a concordant of *Carbo veg.* The skin is dry, parchment-like, the face is sunken, pale or earthy, and expressive of deep-seated distress. When eruptions are present the crusts are thick on an angry, excoriated surface, or dry, forming bran-like scales. As the child grows weaker, the eruption assumes a darker hue and intertrigo may look even purple. *Arsenic* develops a perfect picture of gastritis acute and subacute. Food and drink cause instant vomiting and diarrhœa. The constant burning thirst demands iced drinks, ice, etc., but they invariably cause distress in the stomach, making the child writhe in agony until they are ejected. The stools green, slimy, bloody, dark, watery, undigested, excoriating and intolerably offensive. The urine may be suppressed, and the child lies in a stupor, hot and twitching. When aroused he is restless, demanding frequent change of position. On awaking he is cross and violent, his pinched features looking more hideous as he contracts the muscles and draws the lips more tightly over the gums. The tendency is surely deathward; but in some cases, when the symptoms appear more slowly, emaciation follows, but dropsy and great debility set in. The child looks like a living skeleton, cannot be raised from its pillow, vomits its food and purges when given drink. *Arsenic* is adapted to such mummified cases, to bottle-fed babies, and to rapid decline, suddenly appearing in chronic cases.

Arsenicum sulph. flav. may be substituted when the symptoms rather favor *Sulphur*. Stools green, slimy, watery and offensive, worse during the day, while it is well known the *Arsenicum alb.* has diarrhœa worse at night, after 12 M.

Arsenicum iodatum may be substituted when the glands are engorged with the usual arsenic symptoms.

Argentum nitricum is adapted to emaciated children who look old, yellow, and wrinkled. The face is pale, sunken, the weakness is so great that every motion is attended with trembling. This exhaustion is the result of rapid loss of fluids, as in cholera infantum, or of long-protracted diarrhœa and defective nourishment. The gastro-enteric symptoms, which indicate it in marasmus, are somewhat akin to those of *Arsenic;* but the inflammation is less intense, while the paresis is more marked in the silver. Thus, with anæmia, weakness and emaciation, it is noticed that fluids taken seem to gurgle through at once. Also diarrhœa of green fetid mucus, with noisy emission of flatus at night. Child craves sweets, yet they aggravate the trouble.

Natrum muriaticum is to be preferred when the child is emaciated, notwithstanding it has a good appetite. The tongue is mapped, and vesicles or herpes form about the mouth. The wasting is especially marked about the neck. (Compare *Verat. alb.*)

In one case a child, who, though old enough, could not talk, was cured with salt. The defect here was not paralysis, but arose from imperfect development of the muscles of the tongue and larynx. So, similarly, *Natrum mur.* may be used internally and topically for weak ankles in children; they stumble, or their feet turn under them. Salt here compares with *Causticum*, *Sulphuric acid*, etc., which, *cæteris paribus*, may relieve weak ankles.

Causticum is adapted to children who grow tardily, and who seem to suffer from a sort of paresis. The abdomen is swollen and hard, but the body is wasted and the feet diminutive. They walk unsteadily and fall easily. This arises not only from weak ankles, but from weakness of brain also. Such children are timid, fear going to bed in the dark, and have a weak memory. They also have intertrigo during dentition, and eczema on the occiput.

Baryta is very similar to *Causticum* in mental weakness, timidity, and slowness in learning to walk. Both, also, have an eruption chiefly on the occiput. But in *Baryta* the brain may be actually undeveloped as in the sclerosis of infants. The child is dwarfish; it does not want to play, but sits idly in a corner. It cannot be taught, for it cannot remember. The face is red, the abdomen bloated, the rest of the body being wasted; stools imperfectly digested, loose and pappy, or hard and dry. Glands are enlarged, especially the cervical and tonsils. Child wants to eat all the time, but is averse to sweet things and fruits. A little food satiates.

Phosphoric acid necessarily favors *Phosphorus*, but the child is apt to be listless and indifferent rather than oversensitive. The abdomen is swollen, and, if diarrhœa is present, there is much fermentation in the bowels. The diarrhœa, though long-lasting, does not proportionately weaken.

Sulphuric acid cures marasmus with restless, nervous, weakly children. They do everything hurriedly and yet without vim. The eruption, similar to *Sulphur*, is associated with bright yellow mucous stools, which are stringy or chopped. In addition, there is generally aphthous sore mouth, yellow and painful.

Natrum sulphuricum is to be chosen when a sycotic constitution is inherited; when the abdomen is bloated, with much rumbling of wind, and when the stool is watery, yellow, gushing, coming on so soon as the child begins to move in the morning. (Resembling, here, *Bryonia*.) Complaints from living in damp dwelling.

Natrum phosphoricum, the remaining soda preparation, we have sufficient knowledge to prescribe it in the marasmus of children who are bottle-fed. Abdomen swollen; liver large; colic after eating; stools containing undigested food.

The *Magnesia salts*, so abused in Allopathy, are certainly neglected by Homœopaths. They correspond to forms ofmarasmus which seem to depend upon defective digestion. In *Magnesia carb.* we find emaciation, swelling of the glands, abdomen bloated and heavy. The child suffers from griping pains, colic, followed by green, watery, sour diarrhœa. At other times the stool, if it stands, forms a green scum resembling that on a frog-pond.

In *Magnesia mur.* the child suffers from ozœna; the discharge is acrid, and the nose obstructed at night; scurf in the nostrils, the alæ and point being red and swollen. The stomach is bloated, and the stools are in large hard lumps, or crumble as they pass the anus. Such a child is puny, rachitic, or has an enlarged liver. The glands are swollen, and, like in *Silicea*, sweat of head and feet accompany all the symptoms. Dr. Clifton confirmed many of the above symptoms of *Magnesia mur.*

Magnesia carb. most resembles *Colocynth* (colic), *Rheum* (sour diarrhœa and griping), and *Chamom.* (green, yellow stools, with colic.)

Conium has been of use when the abdomen is hard and distended; frequent sour stools, undigested. The effort at stool causes great weakness.

Gettysburg water has proved efficacious in affections of the joints and bones. Hip-disease, Pott's disease, with ulceration, the discharge being thin, watery and offensive. The child suffers from diarrhœa, worse at every change in the weather. (Introduced by Dr. Macfarlan.)

Lithium carb., to which the Gettysburg water chiefly owes its efficacy, may be successfully used when the child has a rough harsh skin; milk crust; ringworm, itching violently. The skin is seldom moist, being generally harsh and dry. The nose is swollen, internally sore and dry, with shining crusts in the nostrils. The diarrhœa is light-yellow, fecal in the morning and offensive at night; worse after fruit.

Staphysagria is too often forgotten. It resembles *Coloc.*, *Cham.*, and *Merc.* The child has a humid, fetid eruption; scratching changes the place of the itching, and increases the oozing. The face is sunken, the nose pointed, and blue rings encircle the eyes. The teeth, as they appear, soon turn dark or crumble. The mouth is aphthous, the gums appearing pale, spongy and bleeding when touched. Nostrils sore with the catarrh; eyelids and corners of mouth ulcerated. Fetid night-sweat. The abdomen is swollen. Colic after the least food or drink. Stools hot, smelling like rotten eggs, or dysenteric. The child is irritable, asks for things, and then indignantly pushes them away.

Viola tricolor certainly leads the list when crusta lactea is the most prominent feature of the case. The incrustations are thick, and discharge copiously a thick, yellow, purulent matter. The child cannot sleep because of the irritation. The urine is profuse, and has an odor like that of cats' urine. During sleep the hands twitch, the thumbs are clenched, the face is red, and the whole body hot and dry.

Hydrastis shows its value in excoriations in the groins, as confirmed by Anna E. Griffith, M. D. In addition, it may probably suit when the following symptoms are present, though as yet clinical confirmation is absent. Eczema on the forehead at the border of the hair, oozing after washing. Thick mucous discharges (more excoriating than the botanically related *Puls.*) Marasmus; great debility, faintness at the stomach; aphthæ of weakly children; tongue swollen, shows marks of the teeth, or appears raw, dark-red, with raised papillæ.

Nitric acid is called for in weakly children, after abuse of *Calomel*, or who have inherited syphilis. The upper arms and thighs in particular are emaciated. There are aphthous ulcers in the mouth, with putrid breath. This acid attacks prominently mucous outlets; so we are apt to find ulcers or blisters about the mouth; soreness and rawness at the anus, etc. The diarrhœa consists of green mucus, sometimes fetid and undigested, and is worse in the morning. Stool followed by great exhaustion. Glands enlarged. Sometimes indicated for the *Calcarea* patient, when debility and wasting persist despite the use of *Lime*.

Muriatic acid stands between *Phos. acid* and *Nitric acid*. Like the former there is present taciturnity; the child is too listless to move or take notice. Like the latter there are aphthæ in the mouth. The child has become exhausted from frequent vomiting and diarrhœa, and the stomach has become so weak it will no longer tolerate or digest food. This gastric atony is most marked about 10 to 11 A. M. The tongue is shrivelled and dry as leather, or covered with deep-bluish ulcers, having black bases; breath fetid; salivary glands tender, swollen. Stool involuntary when passing urine, followed by protrusion of purplish, extremely sensitive piles; prolapsus ani during urination. Also useful in muscular debility following abuse of opiates, soothing syrups, etc.

Theridion, recommended by Baruch for scrofulosis, has proved of great value in infantile atrophy, caries of the bones, rachitis, scrofulous enlargement of the glands, especially after the failure of *Sulphur*, *Calcarea* and *Lycopodium*.

Ozone.—In some cases in which the symptoms clearly indicate *Sulphur*, but that remedy fails, ozonized water cures. The symptoms from provings are all but identical with *Sulphur*. In one case a hip-disease which defied the latter remedy was cured by ozone water, three teaspoonsfuls daily. *Ozone* may be made by adding three parts of strong *Sulphuric acid*, in an open mouthed vessel, containing two of *Permanganate of potassium*. The mixture, says Bottger, will continue to give off *Ozone* for several months. The child may inhale such ozonized air.

Oleum jecoris aselli, according to the provings, corresponds to atrophy of infants. It resembles *Phosphor.* and *Iodium*, and especially *Calc. phos.* The child is emaciated, with hot hands and head. Constant tendency to catarrhs. Bones affected; rachitis. Fever at night with sweat, mostly on the head, neck and hands. Cannot take milk. Vivid dreams; restless and feverish at night.

Hypophosphite of lime, when the child from excessive and protracted loss of fluids, as from long-lasting diarrhœa, chronic suppuration, etc., is reduced almost to a skeleton. Face wan, pale. Abdomen bloated. Limbs habitually cold. At times the pale face flushes, the head becomes hot, and the child nervous and excitable. Debility, with copious exhausting sweats. Compare *Chinchon.*, *Phos.*, *Calc. c.*, *Phos. acid.*

Cistus canadensis has hot, gray-yellow, spurting stools; worse after fruit, and from 12 P. M. until noon. The glands, especially the cervical, are swollen or suppurating. All symptoms worse in hot weather. Tetter on and around the ears. Caries; indicated in thin scrawny children, of a well-described scrofulous diathesis.

Arum triphyllum, though not well-defined as a remedy in diarrhœa, becomes indispensable in some cases (especially after scarlatina), with boring in the nose, picking at one spot; restless tossing; irritability; mouth and nose sore, raw; alæ and corners of mouth cracked and bleeding; putrid odor from the mouth.

Mercurius has many similarities with atrophy of infants, but must be used with some reservation, as relapses often follow its administration. It is, however, admirably adapted as an intercurrent when *Sulphur* ceases to improve. Its distinctive symptoms are: Emaciation; skin dry, rough, dirty-yellow or clammy, especially that of the thighs; icy-cold sweat on the forehead, sour or oily sweat on the scalp; eruption like herpes, but soon becoming pustular or suppurating; glands swollen and suppurating; skin chaps easily, becomes raw and sore; thirst; frequent attacks of jaundice; skin yellow; abdomen and right hypochondrium swollen and sore to pressure; stool green, sour, watery, with emaciation; diarrhæa bloody, slimy or green, with tenesmus often continuing after stool. In this latter symptom *Mercury* exhibits more constancy than in any other. It is often associated with colic, as from cold or indigestion. Prolapsus ani after stool, the tumor being dark-red and sometimes bloody. Genitals become sore and excoriated: urine causes pain; child pulls at the penis. The child is pale, weak and obtuse, or precocious and restless. In the evening it becomes anxious, restless; face becomes hot and red; speech is hurried, all reminding one of *Belladonna*. The fontanelles are open, the head large and covered with an offensive sweat. The gums are soft and bleed easily. Ophthalmia is common, with suppuration, especially when the lids are involved—all worse from the heat of the fire. Sour night sweats. It is rather inimical to *Silicea*, and must be carefully differentiated.

A careful comparison should be made of all the remedies bearing on any phase of the disease or case and its causes.

INFANTILE CIRCULATION.

DISEASES OF THE CIRCULATORY SYSTEM.

The organs concerned in the circulation of the blood are the heart, arteries, capillaries and veins, for the development of which, the reader is referred to Vol. I., p. 38, and for the peculiarities of the fœtal circulation to page 42 of the same volume.

In the new-born child the heart weighs from eight to thirteen drachms, while that of the adult weighs eight ounces. Thus the adult heart has but six times the weight of that of the newly-born. Thus the newly-born heart is four times as heavy in proportion as that of the adult. With this relative increase in muscular substance, increased activity of its function goes hand in hand. Again, the manner of circulation of the blood current must be emphasized. The circulation of blood, even in the large arteries, does not depend solely upon the action of the heart muscle and the elasticity of the artery walls, but also upon the activity of the voluntary muscles. When these contract, the small blood vessels are emptied; when they relax, these are filled by aspiration. This important factor contributing to rapid circulation is not so active in the infant where the muscular system is but inadequately developed. Thus the heart muscle has to perform part of the labor which in advanced years is borne by the voluntary muscles. Nor is this all. From its ventricular orifice to the insertion of the ductus arteriosa Botalli the aorta is narrower in early age; the young heart has to overcome this narrowness, in fact has to dilate the aorta to its later norm. With this labor corresponds its size, as the size of a voluntary muscle with its exertion. Thus, the heart of a baby of fifteen months is about as large as that of a child of five years. But not only will its size grow with its labor, but also its danger. Any organ with a rapid physiological action — be this action, nutrititive, that of growth, or dynamic exertion — is liable to become the seat of pathological changes.

A fine illustration of this point is yielded by the statistics of heart diseases in the fœtal and post-natal periods. Before birth, the function of the heart is principally performed by its right half, after birth by the left. In consequence the diseases of the fœtal heart are met with on the right side in ninety or ninety-five per cent. of all the cases while the large majority of heart diseases after birth, in any period of life are found on the left side. (Jacobi).

CONGENITAL ANOMALIES.

Acardia is usually accompanied with acephalia and is only of anatomical interest; the umbilical vein in the body of the mother supplies the circulation to the fœtus, which is unfitted for life. The heart may be abnormally small, either with a structure otherwise normal or with two or three cavities. The heart may be found outside the thorax or it may exist in a fissure of the sternum. (Ziemssen). The sternum may be absent and the integument wanting, and when this condition occurs we have the heart entirely exposed, or merely covered with the pericardium.

In very rare instances a defect or splitting of the diaphragm occurs, and the heart then penetrates through this opening into the abdominal cavity. Transposition of the heart is of rare occurrence. If the formation of the septa has failed to take place, there will be but one auricle and one ventricle. Generally, however, the septa are indicated by projecting bands or are fully developed in one or the other chambers, so that there may be two completely separated auricles and only one ventricle, or *vice versa*. As the foramen ovale, in the physiological state, at first furnished a small communication between both auricles, so do we also here find the most frequent defects. It also happens sometimes that the left auricle communicates with the right ventricle, or, *vice versa*, through an oblique communicating passage. Most of the cases are then also complicated with extensive defects of the septa and faulty origin of the roots of the large vessels, which may also be produced by the insertions of the septa having left the median line. It thereby becomes possible for the inferior vena cava to terminate in the left instead of the right auricle, or for the aorta to originate from the right side of the heart.

Of the vessels, the pulmonary artery is either entirely absent, or is very much constricted at its origin, and only becomes dilated beyond the ductus arteriosa Botalli, which conducts the blood to it from the aorta. When there is only one ventricle, the aorta supplies the place of the pulmonary artery. What has been said of the pulmonary artery may also happen with the aorta—it may be misshaped or completely closed; it then receives its blood from the previous remaining ductus Botalli.

The fœtal type of the distribution of the blood is wholly retained, the aorta supplying the upper half of the body with blood, and the pulmonary artery, through the Botallian passage, the lower half of the body. Transposition of the large vessels has taken place, the aorta springing from the right, the pulmonary artery from the left ventricle, and both vessels have originated from the same ventricle.

The aorta has been found divided into two equal or unequal roots, one of which sprung from the left, the other from the right ventricle, and the bulb of the aorta has been immensely enlarged and represented a third ventricle. The ductus Botalli often remains permeable, or is absent altogether, or may become developed into a permanent vascular trunk.

The venous terminations in the auricles may be transposed in the same manner as in the case of the arteries with the ventricles, or the vena cava and the pulmonary veins terminate in *one* auricle only. Congenital abnormities of the valves, and ostia in general, are comparatively rare, and can more readily be attributed to fœtal inflammatory processes, fœtal myocarditis, that to actual arrest of development. The most frequent of these are:

Stenosis of the conus of the pulmonary artery, or of the aorta, a condition in which the muscular structure forming the conus has been converted into a white callous mass. This stenosis occurs more frequently at the pulmonary artery than at the aorta, and according to Bamberger, is one of the most frequent causes of congenital cyanosis. The foramen is invariably found open, or the septum of the ventricle has not even become completely developed. (Vogel).

These defects may be classified as follows:

Stenosis and atesia of the pulmonary artery with closure of the septum; the narrowness and closure in these cases are primary.

Stenosis of the right conus arteriosis, with an opening in the interventricular septum.

Simple stenosis and artesia of the pulmonary artery, with an opening in the ventricular septum.

Combined stenosis and atresia of the pulmonary artery with:

(*a*). Partial persistence of the common truncus arteriosis. (*b*). A bilocular heart, in which the division of the truncus arteriosis is incomplete. (*c*). A single ventricle, with an auricular cavity more or less divided in two. (*d*). A subdivided ventricle, with a simple auricle. (Lebert).

The valves may be cartilaginous, hypertrophied, or the auriculo-ventricular valve thickened and numerous columnæ papillaries and falsely inserted chordæ tendinæ occur; or on the contrary, the valves are transparent, very much attenuated and perforated· In rudimentary construction of the large arteries, or false insertion of the septa. the tricuspid or semilunar valves may also be completely absent. The valve of the foramen ovale may be absent altogether, or become prematurely closed; various malformations have already been observed on the Eustachian valve. (Vogel).

Symptomatology—In spite of many peculiarities, true pathognomonic symptoms are entirely wanting. This is in part, the result of the varying degree of compensation, which is often sufficient for many years. Although the gravest malformations of the heart may cause death before birth, or in a few days, weeks, or months after it, there are cases in which a very tolerable life could be maintained by some precautions, although from the earliest childhood the signs of a malformation were evident and accompanied with many inconveniencies. Here, from the very beginning, the compensation was inadequate, yet so far sufficient that life was not directly threatened. There is a class of cases, in which the compensation is for a long time so perfect that for many years the patients feel none of the subjective annoyances of heart disease, till either the compensation becomes insufficient and the symptoms of heart disease appear progressively, or till the equilibrium is disturbed by some acute intercurrent disease, a wound or any pathological cause. Secondary troubles, and especially the progressive development of tubercles of the lungs, are liable to shorten life, not only by the serious complications themselves, but also directly to increase by them the disturbances of the circulation.

When attention was first directed to congenital heart disease, the blueness (cyanosis) especially attracted attention, and for a time was considered pathognomonic. Yet blueness, from the very beginning of life, is observed only in exceptionally grave disturbances of the circulation without compensation. The cyanosis, that rapidly passes off from children that come into the world nearly asphyxiated, persists in these severe cases, and is accompanied with superfici rapid breathing; it extends from lips and cheeks over nose and ears the whole face and the extremities, and is increased by strong movements or crying; indeed there may occasion transitory attacks of suffocation, in which convulsive twitchings are not uncommon. Such children grow continually weaker, the skin becomes cold, and so they die either asphyxiated or in a slow collapse. But if the disease is of such a nature as to permit the development of a collateral circulation, the danger of suffocation, the great dyspnœa and the cyanosis decrease, the child becomes tolerably well nourished, dyspnœa and palpitation although occasionally severe, appear only on exertion and the child thrives and lives a bearable life, till either the compensation becomes less and less adequate, or till he is greatly shaken by an acute intercurrent disease, in which case he may either die rapidly asphyxiated, or recover, but to be more short-breathed and cyanotic than before. These children are generally feeble and anæmic with a tendency to headache, faintness and dizziness, yet occasionally they are strong and show no signs of imperfect nutrition. The hæmorrhagic tendency of these children, which was formerly considered common is relatively rare, if we except the later hæmorrhages from progressive pulmonary tuberculosis. These patients are not more liable to catarrh than others; the warmth of the body usually suffers; the extremities are cold, and the patients very sensitive to external cold.

The *treatment* will be about the same as that for Cyanosis, etc.

CYANOSIS.

This peculiar condition, known under the various names of morbus cœruleus or the blue disease, and cyanosis, may be defined as a permanent state of lividity or blueness of the skin, depending upon numerous malformations or derangements of the heart and great vessels. In a comparatively slight degree, this condition attends many of the chronic organic diseases of the circulatory organs, and is also transiently present in the course of some acute diseases, but they are merely due to the imperfect oxygenization of the blood.

There is however one form of cyanosis, occasionally met with that merits a special reference. In these cases the blueness of surface has appeared from three or four days to as many weeks after birth, has been intense in its degree and associated with marked disturbance of respiration, and yet, under proper treatment, the infants have usually recovered. It is believed that the cause of such cyanosis is to be found in atelectasis of the lungs, which acts partly by causing general venous congestion, and partly perhaps by obstructing the flow of blood through the pulmonary artery, so that the right cavities of the heart become distended, and there results an admixture of venous and arterial blood through the still unclosed foramen ovale.

The mere persistence of the foramen ovale can scarcely be regarded as a cause of permanent cyanosis. It is quite possible that during the early days of extra-uterine life, a certain amount of cyanosis might exist owing to the admixture of venous and arterial blood allowed by this opening, but after the forces of the circulation become equalized, it is quite certain that the valve of the foramen may remain unattached or may even be somewhat insufficient to close the opening and yet no cyanosis be present.

Theories as to the Production of Cyanosis.—In the vast majority of cases, the malformation which causes cyanosis is of such a character as to allow admixture of the venous and arterial blood, and, at the same time, to interfere more or less with the circulation of this mixed fluid. Ever since the time of Morgagni, authors upon this subject have been divided in opinion as to whether the coloration of the skin were due exclusively to one or the other of these causes; obstruction to the cardiac circulation and consequent venous congestion, or intermingling of the venous and arterial blood. The first of these causes cannot be considered competent to fully explain all the cases and peculiarities of cyanosis, although such central obstruction will unquestionably aid in its production. Nor can the second theory be held exclusively sufficient, since not only are there cases met with where cyanosis is present, and yet no admixture of venous and arterial blood is possible, but also, on the other hand, where a considerable, degree of admixture exists without the production of cyanosis. It seems necessary therefore, as Smith has clearly pointed out, that any theory which pretends to embrace all the elements of this complex condition, should embody a reference to the fact that the essential defect in cyanosis is a want of arterialization of the blood. (Meigs & Pepper.)

Symptomatology.—The most characteristic symptom of cyanosis is the lividity of the surface, which varies in different cases from mere duskiness, to a deep purplish tint. This color varies in degree in different parts of the body, being most marked in the distant, especially the dependent portions, the mucous membranes, and wherever the capillary vessels are abundant, as in the face. Its degree varies, finally, in the same case with the condition of the circulation. In slight cases where the patient is quiet, and the circulation tranquil, the discoloration of the surface may be imperceptible, but upon any exertion, and especially in the more severe cases, the lividity becomes much intensified. In some instances there may be actual ecchymoses of the surface as in purpuræ. The state of the general nutrition is much impaired, and the subjects of this disease are usually stunted and illy-developed. In many instances the generative system appears even more imperfectly developed than the rest of the economy. The temperature of the body is always reduced and exposure to cold is very poorly borne. (Meigs & Pepper.) Almost all suffer from imperfectly developed pectoral muscles and pigeon-breast. The extremities are always cold and moist, very much like the skin of a frog, the tips of the fingers and toes swell up bulbous, over which the nails, curved like claws, project; the cutaneous veins are preternaturally large; the patients are unable to exert themselves in any manner whether to run or climb, or cry continuously, for all these efforts cause them severe pain in the præcordia, dyspnœa, and palpitations. In infants such paroxysms not rarely terminate in convulsions. Epistaxis occurs tolerably often and as a rule gives temporary relief. Also from the mouth, stomach or rectum. (Vogel.) The pulse may be regular and of fair volume, but more frequently is small, irregular and intermittent and palpitation is very readily induced by exertion.

Treatment.—The patient should be warmly clothed, wearing a flannel shirt next the skin, as all heat should be economized in these cases, and at the same time avoiding any exposure to severe cold. It has been recommended by Dr. Meigs that such children should be placed upon a pillow, upon the right side, the head and trunk being inclined upwards about 30° or 45°. The relief afforded by this position is thought to be due to the fact that the heart's action is far more free and unincumbered when the child is placed upon the right side, with the trunk somewhat elevated. The therapeutics of this malady are such as may be applied where the cyanosis arises as a consequence and symptom of other derangements, and suggest: *Camph.*, *Conium*, *Cup.*, *Dig.*, *Lach.* *Opium*, *Aconite*, *Amm. carb.*, *Arn.*, *Ars.*, *Puls.*, *Rhus*, *Samb.*, *Sec.*, *Verat. alb.*

The following have been recommended in cyanosis cardiaca, morbus cœruleus neonatorum: *Dig.*, *Lach.*, *Arn.*, *Bry.*, *Croc.*, *Laur.*, *Nux*, *Opium*.

The following indications given are collected from Guernsey, etc.

Aconite.—If at any time there should be much vascular excitement, heat or restlessness, this remedy may be needed.

Arnica.—In cases where there is hæmorrhage from the nose and mouth, and great strangling and suffocation. The case seems almost hopeless.

Arsenicum.—The symptoms are much aggravated from the least exercise. Much emaciation; cold sweat; great debility.

Calcarea carb.—This remedy may be indicated in leucophlegmatic children, with large, open fontanelles; the head perspires very much.

Carbo v.—The veins stand out very full and are remarkably blue.

China.—In some collapsed stages, with waxy paleness and coldness of the skin.

Digitalis.—The child cannot be turned in bed or moved suddenly without nearly fainting and without an inclination to vomit; chilliness; coldness; coldness of the extremities; blue color of the skin, especially of the eyelids, lips, tongue, nails; unequal irregular pulse.

Lachesis.—When the suffocating spells and the increased blueness become worse after sleeping. Great tenderness of all the flesh; it is exceedingly difficult to handle the child at all; the least touch seems to hurt it and to leave a deeper blueness like a bruise. Suffocative attacks on touching the larynx or moving the chest; fainting and anxiety from the slightest motion of the child; purple color of the skin; coldness of the extremities.

Laurocerasus.—A little exercise produces gasping for breath and increased blueness. The ends of the fingers and toes are knobby and larger than any portion of these extremities; the child is better when lying still. Slow, feeble, almost imperceptible breathing with moaning; irregular beating of the heart with slow pulse; soporous condition; amelioration in the open air.

Phosphorus.—In very tall and slim children, with much oppression of the respiration and swelling of the feet.

Secale c.—In very thin, scrawny children with shrivelled skin; especially when there are spasmodic twitchings, sudden cries, feverishness.

Sulphur.—This remedy will be found useful in many cases characterized by the real sulphur constitution.

As in all these cases there is a flabbiness of muscular tissue.

system should be stimulated by food and remedies as much as possible. As remedies the *Kali's* stand first. *Kali sulph.*, when the serous tissue is also feebly developed. *Kali mur.* where the nutrition is at fault, and *Kali phos.* where the nervous as well as muscular system is defective. Milk as strong, or old, as it is possible for the child to digest should be chosen. The child should be kept as quiet as possible, allowing it however plenty of fresh air and resorting to passive motion. Rubbing with oil would do good.

ENDOCARDITIS — RHEUMATISM.

Diseases of the heart in infancy often develope themselves very insiduously and often without prominent local or general symptoms, Many cases seem to arise from digestive troubles, although the most frequent cause of these affections are rheumatism, the peculiar alterations of the blood present in scarlatina, rubeola and diphtheria, and extension of inflammation from the adjacent tissues, in cases of pleurisy or pneumonia. Of these well recognized causes, rheumatism is by far the most frequent; for although young children are comparatively rarely the subjects of this disease, it is followed by some cardiac complication in a larger proportion of cases in childhood than in after years. (Meigs & Pepper). Of these, endocarditis is of most frequent occurrence. This may occur during intra-uterine life and have as its results some of the cardiac abnormities heretofore described, or, it may originate after birth in the same way as it does in adult life. (Steiner).

Acute rheumatism in children runs a shorter course, and as a rule is less intense than in adults. There is intense fever, burning skin, great thirst, an enormously accelerated pulse, and great restlessness and sleeplessness supervene, the whole lasting at the most, eight or ten days, and gradually subsiding. In most instances the patients are very pale and collapsed, have a remarkably sad expression of countenance, and a lethargic appearance; they keep the affected point in the utmost possible state of quiescence, while the free extremities on account of the intense fever heat are incessantly restless and agitated. Touching and still more the moving of the diseased members is extremely painful and the utmost anxiety is manifested whenever any approach is made to the affected joint. (Vogel).

Lesser degrees of rheumatism, are according to Jacobi, of very frequent occurrence and are very apt to be overlooked. In these the swelling of the joints is often but trifling and sometimes disappears after a short time. The pain corresponds with the rapidity and quantity of effusion, and is, therefore, not always excessive; it is even trifling and easily overlooked in rachitic individuals in whom flabbiness of synovial membranes and ligamentous apparatus are two permanent characteristics. Redness is but slight or does not exist. Temperature is but rarely very high as long as polyarthritis is the only symptom, and sometimes even low, after the first attack of endocarditis has set in. Unless there is endocarditis, respiration is in proportion to the fever, perspiration is not copious; urine not scanty, not often loaded with uric acid. On the contrary, it is frequently copious (particularly in early complication with mitral incompetency and venous obstruction), and pale. The course of the disease is less regular than in the adult. In still lesser degree it exists in the form of muscular rheumatism, the "growing pains" of the laity. As to the frequency of rheumatism at an early age, Jacobi says: "As a rule you will find that the frequent occurrence of rheumatism in infancy and childhood is resolutely denied, although every practitioner will have plenty of opportunity to come across non-congenital heart diseases at an early age." Staeger reports two cases at a very early age, nine weeks and seven months and Vogel mentions a case treated by him, one year and nine months of age.

Pathological Anatomy.—This does not materially differ from that of adult life. Red spots according to Luschka, are at first observed on the endocardium; the superficial surface is as yet perfectly smooth; this smoothness, however, still disappears, the superficial surface becomes rough, and now the exudation under the microscope exhibits entire and destroyed epithelium cells, exudation, corpuscles, and fibre elements. The roughened places on the endocardium soon arrest some fringes of fibrine, from the onward flowing current of blood, and thereby acquire a flocculent appearance. If they exist on the valves or in their immediate vicinity it will cause these to shrink or alter their attitude and insertions. (Vogel.) The valves then present thickening, contraction and conalescence, (as also their chorda tendinœa), with vegetations and calcareous incrustations leading to contraction of the orifices of the heart, or to imperfect closure from insufficiency of the valves. These alterations give rise to certain sounds called murmurs, for the physical diagnosis of which, the reader is referred to works treating upon this subject. Sometimes a portion of coagulated fibrin is torn from off the valves by the rush of lood and washed away into the circulation, becoming finally impacted n a distant vessel. These are called thrombi and often lead to fatal results.

Symptoms and Course.—Children laboring under endocarditis always have fever, and, if they have already got rid of the fever which accompanied the acute rheumatism, will again be attacked by violent febrile symptoms on the appearance of this complication. Palpitation of the heart is always present, and is increased on exertion, such as crying or bodily exercise; and a peculiar nervous dyspnœa or shortness of breath, invariably comes on at the same time, which at first reveals no demonstrable mechanical causes; later on however it is satisfactorily explained by the stagnation of blood in the left auricle. (Vogel.) There is also an expression of anxiety and restlessness, a sense of oppression or pain over the heart, dry cough, epistaxis and unquiet sleep, often interrupted by delirium. By embolic impaction (thrombi) encephalitis or capillary apoplexy may be produced in the brain and circumscribed pneumonia in the lungs. (Steiner.) Chorea minor is sometimes seen as a complication. The diagnosis in endocarditis rests entirely upon a physical exploration of the chest and the detection of abnormal sounds at the auriculo-ventricular, pulmonary, and aortic orifices. In rheumatism and the exanthemata the heart should be carefully watched for the first signs of disease, in order to avert the serious consequences that necessarily result during the course of endocarditis.

Prognosis.—As a simple acute inflammatory process endocarditis is not very fatal, though by its complications and after results, especially consequent pericarditis, it is very often a serious disease. (Steiner.) It should not be forgotten, however, that while the tendency for valvular disease is to increase, yet the growing heart has the power to counteract valvular disease "whereby it can accommodate its form and manner of increase to material accidents and so repress or counteract their evil tendencies. (Latham.)

Treatment.—The following are recommended: *Aconite*, *Ars.*, *Aur.*, *Bell.*, *Bry.*, *Calc.*, *Cocc.*, *Colch.*, *Phos.*, *Puls.*, *Rhus*, *Spig.* *Cact.*, *Cann.*, *Caust.*, *Cimicif.*, *Crot.*, *Dig.*, *Gels.* The most frequently indicated are *Bryonia*, *Kali carb.*, *Spig.* and *Arsenicum.*

Valvular disease, *Cactus grand.*, *Kalmia*, *Spong.*, *Spig.* (Jahr.)

PERICARDITIS.

This may occur at any period after birth. In very young infants it has been observed in conjunction with peritonitis, and was apparently due to erysipelas, while in other cases no cause could be assigned for its occurrence. (Meigs & Pepper.) It is most frequently observed in the course of acute articular rheumatism, with or without endocarditis and valvular disease, next in frequency during the course of pleurisy, pneumonia, the acute exanthemata, especially scarlet fever and small pox, also in parenchymatous nephritis; and less commonly in tuberculosis, pyemia, and purpura hæmorrhagica. In new-born children the disease is usually purulent and ichorous, the result of some septic process, which often proceeds from the umbilicus or of tubercle and it is then generally complicated with pleurisy, meningitis or peritonitis. (Steiner.) Billard speaks of its occurrence during intrauterine life and Kirchenmeister of its idiopathic occurrence in a girl eleven months old. Primary pericarditis is infrequent in childhood. most of the instances being secondary to some other diseases. Chronic pericarditis is also found in children.

Pathological Anatomy.—The chief indications of the inflammation are hyperæmia, thickening and roughening of the surface of the epi- and peri-cardium with abundant exudation in the form of net-like papillæ (cor villosum) or membranous folds; or the exudation may take the form of fluid with fibrinous flocculi, may be purulent and occasionally is found to be tinged with blood. As the result of chronic pericarditis there are sometimes found layers of mortar-like substance, from two to four millimeters thick or tubercular nodules. Partial adhesion and in some rare cases complete fusion of the two serous surfaces, hypertrophy, softening, inflammation and fatty degeneration of the heart are also found as the result of this disease. (Steiner).

Symptomatology.—The pathological picture of pericarditis, commonly delineated in the text-books, applies but imperfectly to children for the phenomena are so variable that, strictly speaking, a description with universally adapted symptoms must in reality be entirely renounced. They are often very mild, and completely masked by the other concomitant diseases—acute rheumatism, pyemia, Bright's disease and tuberculosis, again they are often very striking and manifest themselves by great oppression of the chest, severe pain, dyspnœa, rapid pulse, fainting, delirium and cyanosis. (Vogel.) More advanced children complain of oppression and pain over the cardiac region and scrobiculus cordis and palpitation of the heart and dyspnœa are often met with, though sometimes they are absent. The pyrexial symptoms are not usually severe, unless they are due to the presence of some other affection, and the pulse is usually small and irregular and beats from 120 to 140 a minute. Besides these symptoms there is œdema, diminished secretion of urine, anxious expression of face, with the features slightly swollen and blanched or cyanotic, an undulatory movement in the jugular veins, delirium, and a peculiar undescribable restlessness of the patient. (Steiner.) In general, children affected with this disease appear to experience violent pain; their cry is painful; the face is pinched; the muscles of the face appear to be constantly contracting. In two instances that came under Billard's notice there were spasmodic movements of the limbs.

On inspecting the denuded chest, the heart at the commencement of pericarditis is seen to beat harder than usual against the expanse of the thoracic walls, and occasionally a slight irregularity of the rhythm is already observable. Later when the exudation increases in amount, and particularly when the fluid part thereof greatly preponderates, the heart becomes displaced toward the left and upward, and will beat correspondingly against the thoracic walls more toward the left and higher up. But if the effusion becomes still greater, then the most characteristic sign comes on, namely, the heart's impulse can neither be seen nor felt. (Vogel.) One of the most important signs, therefore, for diagnosis is the alteration in the outline of the cardiac dullness; and another is the presence of a creaking or rasping murmur the result of friction. This friction murmur is neither so often nor so well heard in children as in adults, and in the former is always indicative of a fibrinous exudation; sometimes it may be felt by the hand, is usually not communicated, is neither systolic nor diastolic, but sometimes continuous, and is generally most audible towards the base or towards the apex. All these signs and symptoms are far from being constant in children, and may be either entirely absent or insufficiently developed when the exudation is small in amount, so that the diagnosis of pericarditis is often difficult and sometimes impossible in children.

Prognosis.— When the inflammation is limited, recovery is the rule, but when the exudation is abundant, especially when it becomes purulent, death occurs almost always, and often with very unexpected rapidity. If adhesions are formed, more especially if they amount to complete fusion of the two serous surfaces, they sometimes lead to disturbances of the circulation, which continue for a long time, or may become permanent.

The *treatment* of this disease of the heart will need our best efforts. The food should be nourishing, but not stimulating. The remedy must be carefully selected and given time to act.

Drs. Kidd and Laurie recommend *Colchicum*. Hartmann also commends it when rheumatic symptoms are present.

Hartmann (Diseases of Children), also advises the use of *Laurocerasus* when there is that form of pericarditis present in which the beating of the heart is scarcely perceptible, or only at a distance from the surface, and is moreover dull; the pulse is rather small, the fever is not inconsiderable consisting of violent chills alternating with extreme heat; the pulse and the beats of the heart are irregular and the diagnosis without the physical signs is scarcely possible. The labored breathing shows that the lungs are weak and it is a condition of impending paralysis.

Also *Cannabis*, when the bounding of the heart seemed to shake the trunk and the outer wall of the chest and the patient was driven about by his anxiety; the palpitation was heard over a large area, even in the pit of the stomach. Towards night the restlessness increased to anguish, which was attended by a frequent desire to urinate, with discharge of a few drops of a whitish, turbid urine.

Aconite.—Chill followed by heat; stitching pain in region of heart. cannot lie on right side; frequent sighing and taking deep breath; feeling of fullness in the chest; dyspnœa; fainting restlessness.

Arnica.—Severe stitching pains, in consequence of trauma; complication with pleuritis.

Arsenicum.—In consequence of suppressed measles or scarlet fever; inexpressible anguish and restlessness, no ease in any position; paralytic feeling in upper limbs; tingling in fingers; flushed face, cold per spiration; worse at night.

Bryonia.—Complication with pleuritis; stitching pain in cardiac region, preventing motion and even breathing; wants to lie perfectly quiet.

Cactus g.—Sensation of constriction in the heart, as if it was grasped by an iron hand; acute pains and stitches in the heart; difficulty of breathing; attacks of suffocation with fainting; palpitation when walking and at night when lying on the left side; cold sweat on the face; no pulse.

Digitalis.—Copious serous exudation; irregular, intermittent pulse; brick dust sediment in the urine; rheumatismus; œdema pedum.

Iodine.—In complication with croupous pneumonia; purring feeling in the region of the heart; violent palpitation increased from the slightest motion, better while lying perfectly quiet on the back; fainting; complications with articular rheumatism.

Kali c.—Stitching pain in cardiac region; swelling between the eyebrows and the upper lids; jerking up of the limbs, much frightened when having the feet touched; worse about 3 A. M.

Lachesis.—Restless and trembling; hasty talking; great oppression; anguish about the heart in rheumatism; irregularity in the beats of the heart.

Pulsatilla.—After decrease of the inflammatory symptoms there still remain severe palpitations, keeping on after the fits of coughing; loose rattling cough, worse on first going to bed; rheumatic pains which quickly change locality; inclination to looseness of the bowels.

Rumex.—During rheumatism burning, stinging pain in left side of chest near heart, when taking a deep inspiration, when lying down in bed at night.

Spigelia.—Severe cases of pericarditis, not relieved by *Aconite*; complicated with rheumatism, pneumonia or pleuritis; stitching pain in chest from the very slightest motion; clear rubbing sounds; purring feeling in the cardiac region.

Sulphur.—Palpitation after going up stairs, with shortness of breath; steady pain in left side through to the shoulders; red lips; sleeplessness, after suppressed itch.

Tartar emetic.—Full feeling, constriction of the chest; palpitation of the heart; pulse rapid, weak and trembling, or small and contracted; complication with pneumonia.

Verat vir.—Faintness after rising from a recumbent position; fainting during a walk; relieved only by lying down.

For a chronic disposition to disease of the heart, *Sulphur* and *Sepia* may be given alternately every two or three weeks.

HYDROPERICARDIUM. PERICARDIAL DROPSY. HYDROPS PERICARDII.

By these terms we are to understand an accumulation of serious fluid, in the pericardium occurring independently of inflammation. But in view of the fact that a certain amount of fluid is met with in most autopsies they are applicable only to those cases in which dropsical accumulation is excessive. It is believed by many that a certain amount of liquor pericardii is present even during life, but Bauer advances the hypothesis that even the normal liquor pericardii is to be regarded as a transudation, which has escaped during the agony or after death, from the vessels and from the heart itself, particularly from the frequently tensely distended right ventricle. Moreover he considers that the transudation continues for a time immediately after death, so that more fluid is found in the pericardial sac when the autopsy is made at a late period, than when it is made early.

Dropsy of the pericardium, alone by itself, occurs only in defects of the heart, where the disturbances of the circulation then manifest themselves earlier on the pericardium than on the pleura and peritoneum. It is less frequent in children than adults, nephritis following scarlet fever being the chief cause in the former. The transudation is composed, as a rule of a clear, yellowish or greenish serum possessing the chemical properties of other serous effusion, i. e., that of a diluted serum of the blood. The pericardium, in contradistinction from purulent pericarditis, is, with the exception of a slight serous infiltration perfectly intact, neither covered with pseudo-membranes nor abnormally adherent anywhere. The muscular coat of the heart itself, as in all dropsical effusions, has more of a yellowish than a red color. (Vogel.)

Symptomatology.—Slight pericarditic effusions cannot be diagnoticated, and, probably give rise to no symptoms. In extensive effusions there is great oppression and even orthopnœa, comes on; the jugular veins swell with every systole and subside again with every diastole. The integument becomes cyanotic with slight œdema, and its temperature is lowered. As the pure hydropericardium is, in every instance, preceded by dropsies in other parts of the body, and, which perhaps still exist, its morbid picture is materially obscured and obliterate this is especially applicable to the respiratory disturbances. The physical signs are the same as in pericarditis, only still more pronounced, and easier to be elicited, for these patients are less severely affected in their general condition, and therefore are more tranquil than those suffering from pericarditis. The præcordial region bulges slightly, the impulse of the heart is weak, or entirely imperceptible, the pulse is small, the dullness on percussion upward very marked and flat. (Vogel.) The friction sound of pericarditis is absent and this for obvious reasons. Epistaxis, headache, vomiting and gastric irritability may be noticed among the general symptoms, especially if there be coincident disease of the heart. (Steiner.)

Prognosis.—Those effusions which supervene upon diseases of the heart always terminate fatally, while those ensuing from scarlet fever are capable of being absorbed. (Vogel.)

Therapeutics.—The experience of the profession seems to have been limited. Jahr recommends *Lyc.* where there is hypertrophy of the heart, and Hughes mentions *Colchicum* and *Arsenicum* in that form supervening on Bright's disease. The remedy that has acted best in the hands of the author is *Kali carb.* See Therapeutic Hints.

DISEASES OF THE ARTERIES AND VEINS.

Diseases of the arteries in infancy and childhood are very rare and are recognizable only *post mortem.* Virchow mentions simply fatty degeneration of the media (tunic) as taking place in juvenile life where there is congenital narrowing and thinness of the coats of the vessels, particularly the aorta and its branches.

Absence of pulse at the wrist may be due to an anomalous termination of the radial artery.

The most frequent deviations in the arterial system are known as:

Erectile Tumors.— These are also known as angioma, telangiectasis, nævus vasculosis and aneurism by anastamosis. This disease is a dilatation of the capillary vessels, and occur particularly on the face, eyelids, lips and neck, sometimes affecting those of the cutis, sometimes those of the subcutaneous cellular tissue, and then again both, at the same time to a greater or less extent. (Vogel.) They exist as spots or tumors of various sizes, bright red or bluish-red in color, consisting of connective tissue and fat inclosing a great number of adventitious blood- vessels of irregular form. They may exist as an elevation of the integument, red in color and often of the shape of a raspberry ;

the deeper seated one presents the appearance of a slightly doug tumor, soft, elastic and white, with a bluish translucency or the sk may be normal in color. Arterial angiomata are of a bright color, som what exalted temperature, and distinctly pulsatile, while those of venous origin are dark and do not pulsate. (Steiner.)

Generally, these vascular dilatations are congenital; their growth does not always progress in exact relation to the development of the entire organism, but surpasses it considerably, so that a small telangiectasis at birth only of the size of a pin's head, at the end of a year may have attained to that of a pea or even of a hazel nut. This fact is universally known; on the other hand, most physicians are not aware of the spontaneous termination of these erectile tumors and vascular motes. The general opinion is that, if no operative assistance is rendered, they will continue to grow, and attain to serious dimensions, and yet the reason why they are so rarely met with in adults and comparatively often in children has never been satisfactorily explained. The true reason for this circumstance is that most of them grow smaller spontaneously, and ultimately disappear altogether although nothing in the shape of an operative procedure had been resorted to against them. (Vogel.) The ragged angiomata disappear sometimes spontaneously, also after suppuration, and gangrene after inflammatory attacks. (Steiner.)

Erectile tumors, the integument of which is almost normal are easily diagnosticated by the facts that they disappear under the pressure of the finger, become tenser and larger during crying and pressing, sometimes pulsate slightly and on auscultation allow a buzzing noise to be heard.

Pathology.—When such a tumor is cut open on the cadaver it collapses very much and gives exit to a tolerable quantity of red serum. On closer investigation it is seen to be composed of merely dilated excavated capillaries, which freely communicate with each other and thus present a spongy formation. Examined microscopically there will be found numerous longitudinal and transverse sections of capillaries, and occasionally has the appearance of small, pouch-like excavations in the vessels, as if the capillaries terminated with bulbous dilatation.

Between these vessels, perfect normal connective tissue is seen. The cavernous angioma which does not often occur in children, consists of a stroma of connective tissue with abundant vascular supply entering a number of irregular cavities communicating with one another. It may be circumscribed or diffuse, and may be situated in the subcutaneous areolar tissue or deeper, even under the facia in the face, neck, extremities, trunk, bones or internal organs, as the liver. The tumors vary in size and may be capsulated and circumscribed or diffuse, fluctuating or firm, sometimes painful and the skin is sometimes thin and discolored, and in other instances quite unaltered. When they burst, the hæmorrhage is always serious, sometimes fatal. It is often painful. (Steiner).

Treatment.— The raspberry colored spots of the skin on the forehead, eyelids, etc., are best, and in the simplest manner removed by vaccination. For this purpose the nævus is punctured ten or twenty times with a needle dipped in vaccine matter, when a few drops of blood will always escape, and if nothing further is done, the operation will prove entirely fruitless, for the vaccine lymph has oozed out with the blood. But if these punctures are quietly allowed to drain off the blood, then cleansed with a little cold water and once more covered with a layer of vaccine matter, all, or nearly all of the punctures will take. On the fifth day, the nævus displays many elevated bluish-red pustules which soon become confluent and begin to dry up by the eighth or ninth day; after the crust has fallen off, a bluish-red cicatrix will at first remain behind, which subsequently fades very much. If a child has already been vaccinated or the nævus is where the vaccination scar would be seen, then we must resort to remedies, or they may be given at once. *Thuja* has been very efficient. Lilienthal recommends *Calcarea carb.*, and Bonhof (A. H. Z., 85, 197) cured a case with *Cundurango* 6 in about three weeks. Inflammation of the nævus set in, after which, it disappeared. Jahr enumerates *Sulph.*, *Calc. c.*. *Phos.*, *Rhus tox.*, *Carbo veg.*, *Silicea*, and *Platina*. Ruckert reports a case cured with *Sulphur* 10, and one " helped " by *Sulpur* 1.

THROMBOSIS — EMBOLISM.

Thrombosis.— This term signifies the coagulation of blood within the living vessels and occurs either in the heart, arteries, smaller veins, capillaries and lymphatics.

An autochthonous or primitive thrombus is one which remains confined in the part in which it first arose. It lies in contact either with the inner surface of the vessel by a greatly varying extent of surface, without sensibly contracting the vessel's channel. Or, it projects farther into the channel, so as to effect a real narrowing of the vessel; so-called partially obstructing thrombus. Or, finally, the vessels to a varying length, is completely closed by the coagulum; so-called, totally obstructing thrombus. The shape of this thrombus corresponds exactly with that of the vessel; if the latter is large and pouch-shaped, the former will be globular; if branched, the thrombus likewise will be branched; but its central part, *i. e.*, the part directed toward the heart always takes the shape of a rounded cone in the arteries as well as in the veins.

Most of these thrombi are called secondary, which arise after primary inflammation of the vessels, or of the tissues immediately surrounding them. The coagulum is continuous with most of the circumference of the vessel. Less frequently there are found between it and the wall, spaces, which are filled with fluid blood; the latter comes from the small vessels which enter in or depart from the vessel at this point.

The character of the thrombus varies. Its surface is always smooth and even, if no especial influences have acted upon it. Thrombi are or are not laminated. At first the thrombus is dark or grayish red, elastic, soft, moist, and has a smooth, glistening, moist surface on section. Gradually it becomes paler, drier, less elastic, even crumbling; its surface on section becomes dull and lustreless and is at different points colored red, brown, gray or yellow. Under the microscope there are to be seen fibrous lamellæ in inconsiderable number and between them shrivelled white and red blood corpuscles, chiefly, however, albuminous molecules. Puriform liquefaction, or softening is the usual metamorphosis of laminated thrombi. There is found at first in the middle of the thrombi and extending thence toward the periphery, a liquid at first sharply circumscribed, later more diffuse; at first more viscous, then of a thin or thick consistency; which, liquid to the naked eye sometimes resembles pure pus, and sometimes has an ichorous character (reddish or brownish, thin, and often of a disagreeable odor). The non-laminated variety may become organized. Thrombi non-organized, gradually become softer and more rotten. In thrombi lining the walls of the vessels and partially obstructing them (or the fibrinous coagula on the cardiac valves) the blood stream may tear off and carry away pieces of them or remove and transport them *in toto*. The same can happen to thrombi which wholly obstruct a vessel and are progressive in growth, if they project beyond the mouth of a vessel in which they were formed; the blood stream which comes in contact with them, tears them or pieces of them away, and carries them farther on. In both cases the pieces torn away are driven into the next narrower parts of the vessels. These deposits are called

Emboli.—These vary from very minute pieces to a size several inches in length and as thick as the finger. Emboli from the beginning obstruct the vessel wholly or in part. The embolus is usually arrested at a part where the vessel divides or where the diameter of the vessel is suddenly reduced by giving off branches. The larger emboli naturally remain in the larger, the smaller only in the smaller vessels; the smallest finally are usually arrested in the first capillary network which they have to pass. These embolisms concern sometimes the capillaries only, sometimes at the same time also the smallest arteries belonging to them. The changes in the organs whose arteries are obstructed by embolism depend upon the embolus itself (its size, number, its power to create mechanical or chemical irritation, etc.,) the kind of vessels (functional or nutritive vessels), the arrangement of the arteries, the re-establishment of a collateral circulation and the structure of the organ itself.

The effects of emboli are: 1. Without serious consequence where a sufficient arterial anastomosis exists, or is established in a very short time. 2. Gangrene, if the main branch supplying an organ, or many large branches supplying it, become wholly obstructed and nutritive blood is no longer supplied. 3. Hæmorrhages arise, superficial bleedings or bloody infiltrations in extended organs, hæmorrhagic infarctions in parenchymata. 4. Metastatic abscesses. (Wagner.)

For an account of thrombosis of the umbilical vessels the reader is referred to Vol. I., page 145, and for cerebral thrombosis, to the chapter on nervous diseases.

The *treatment* of these cases must be directed to the cause and to the effect. If due to phlebitis or arteritis the remedy must be selected accordingly. *Hamamelis*, *Aconite*, *Arnica* or *Belladonna* may be indicated. The effects will need to be treated independent of the cause, the symptoms being the guide, *Arsenicum*, *Hepar*, *Silicea*, etc., may be needed. If traumatic, consult Gilchrist's Surgical Diseases.

GENERAL THERAPEUTIC HINTS.

The following therapeutic indications collected from Homœopathic Therapeutics should be consulted in all cases, from infancy to puberty:

Aconite.— Oppression about the heart, burning flushes along the back, heat in the chest, difficulty of breathing, flying heat in the face; fainting with tingling.

Æsculus hip.— Palpitation, heart's action full and heavy; darting in the region of the heart; dull, aching burning in cardiac region; pulse quick, soft and weak; lameness and weariness in the back; faintness at the stomach.

Agaricus.— Burning, shooting pain in the region of the heart, extending to the left shoulder blade, caused by deep inspiration, coughing, sneezing, hiccough; oppression on bending the body; feeble filiform pulse, becoming slow and irregular.

Ammonium carb.— Audible palpitation, with attacks of great anxiety, as if dying; cold sweat; involuntary flow of tears; unable to speak; loud, difficult breathing and trembling of hand; debility and soreness of the whole body; pulse hard, tense, frequent.

Anacardium.— Stitch in the region of the heart, during inspiration; at night, stitches piercing through and through at the heart quickly succeeding each other; beating in the bloodvessels; rheumatic affection of the heart and pericardium.

Apis mel.— Acute pain just below the heart extending diagonally toward the right chest; blowing sound with the diastole; great prostration; pulse accelerated, full and strong, or feeble and imperceptible.

Argentum met.— Frequent, spasmodic, painless twitchings of the whole cardiac muscle, especially when lying on the back; lame, weakness with all pains.

Argentum nit.— Heart's action irregular, intermittent; exertion causes strong beating; pains about the heart, can hardly breathe.

Arnica.— Hypertrophy of heart induced by over-exertion; intermittent, feeble, burned, irregular pulse; sudden pain as if the heart got a shock; region of base of the heart feels as if bruised.

Arsenicum.— Palpitation after suppressed herpes or footsweat, with feeble, irregular pulse; the heart beats strong, visible and audible at night, more rapidly when lying on the back; pericarditis in consequence of suppressed measles, or scarlet fever with inexpressible anguish and restlessness; worse at night, flushed face, cold perspiration.

Asafœtida.— Nervous palpitations.

Aurum met.— Frequent attacks of anguish about the heart with tremulous fearfulness, violent beating of the heart after exertions, with great agony; when riding or walking palpitation compels to stop; palpitation with irregular, intermittent pulse and short breathing.

Badiaga.— Nervous palpitations, cardiac debility.

Baptisia.— Brain fag; violent headache and vomiting; compass and frequency of heart's pulsation seem to increase and fill the chest, with a slow and faint pulse; restless and uneasy; continually changes position, general weak feeling.

Belladonna.— Nervous palpitations, with congestion to the head; pressure in the cardiac region, which arrests the breathing, causing a sense of anxiety. Palpitation on going up stairs; throbbing of carotid and temporal arteries.

Benzoic acid (*Benzoate of Ammonia*).— Rheumatism of the heart; awakens after midnight with violent palpitation of the heart and temporal arteries; urine high colored, offensive, hot scalding, ammoniacal, high specific gravity.

Bromium.— Hypertrophy with enlargement of the heart in young growing persons; violent palpitation when walking, and at night, so that one cannot lie on the left side; pulse much accelerated.

Bryonia.— Pericarditis, with sticking pain in the cardiac region, preventing motion and even breathing; wants to lie perfectly quiet; heart beats violently and rapidly; from repercussion of measles.

Cactus grand.— Pericarditis and endocarditis; sensation of constriction of the heart, as if an iron band prevented its normal movements; acute pains and stitches in the heart; difficulty of breathing; attacks of suffocation, with fainting; cold perspiration on face and loss of pulse; palpitation when walking, and at night when lying on left side. Nervous palpitations; easily frightened, often awakes in a fright; numbness of left arm, annoying creeping sensation from before backwards in cardiac region, œdema of the hands, especially of left one; endocardial murmurs, excessive impulse, increased præcordial dulness; enlarged right ventricle; irregularity of the heart's action, at times frequent, at others slow; great irritation of the cardiac nerves; enlarged left ventricle; pains in the apex of heart, shooting down the left arm to the ends of the fingers; feeble pulse, dyspnœa; general weakness, prostration, great depression, sleeplessness, fainting.

Calabar (*Physostigma*).— Spasmodic trembling and twitching of the muscular fibres of heart; pulsations through the whole body, particularly in the chest, each beat of the heart distinctly perceptible in the chest and temples; heart's action retarded, with diminished impulse, no abnormal sounds, radial pulse irregular and weak; heart's action irregular, feeble, or tumultuous.

Calcarea carb.— Nervous palpitation after suppressed eruptions and pimples on the face, from onanism; tremulous palpitation with anguish; worse at night and after meals.

Camphora.— Præcordial distress and nervous palpitation, attended by coldness of the skin, cold extremities, pale face; sudden oppression of breathing; irresistible sleepiness; diminished flow of blood to those parts remote from the heart.

Cannabis indica.—Pressing pain and anguish at the heart, with dyspnœa the whole night; painful sticking, as with the prongs of a fork, in the heart; stitches in the heart, accompanied by great oppression, relieved by deep breathing.

Cannabis sativa.—Sensation as if cold water were dropping over the region of the heart; palpitation, gradual loss of flesh and strength, from imperfect oxygenation of blood; violent beating of the heart on moving the body, and on stooping, with warm sensation about the heart; pulse weak, often almost imperceptible.

Carbolic acid.—Fearful beating of the heart, especially at night, accompanied by great dyspnœa; stitches in cardiac region; bellows' murmur over mitral valve.

Carbo veg.—Impending paralysis of the heart, complete torpor, cyanosis, blood stagnates in capillaries, cold face and limbs, cold sweat, filiform, intermittent pulse.

China.—Nervous palpitations after great loss of fluids; heat and redness of head and face, with cold hands; pulse frequent, small, improving after meals.

Cicuta vir.—Nervous trembling, palpitation of the heart, feels as if the heart stopped beating, with sensation of faintness.

Cimicifuga.—Excessive impulse of the heart over an extensive portion of the left ventricle, with dulness on percussion; heart's action ceases suddenly, impending suffocation; pains from the region of heart, all over the chest and down left arm, palpitation, unconsciousness, cerebral congestion, dyspnœa, face livid, cold sweat on the hands, numbness of the body, the left arm numb, and as if bound to the side; pulse weak, irregular, trembling; chorea of heart, tumultuous, irregular, unexpected, and strange motions of the heart; myalgia cordis; cardiac debility; rheumatic endo- and pericarditis.

Chloralum.—Dilatation of heart, a weakened heart, peculiar fulness and tightness of chest, with a sense of emptiness in the stomach; violent palpitation, with great difficulty of respiration; heart's action regular, but with increased frequency and diminished force.

Clematis er.—Sharp stitches in region of heart, from within outwards; tearing pain in the forepart of the chest above the heart.

Cocculus.—Tremulous palpitation from quick motion and mental excitement, with dizziness and faintness; pulse small, spasmodic, often imperceptible.

Colchicum.—Heart disease, following acute rheumatism, hydropericardium; pressure and anxiety in præcordial region; fulness and oppression, as from stagnation of blood, in the heart, at night, while lying on left side, he is obliged to turn to the right side; dull, irregular, seemingly suppressed beats of heart, with a peculiar sensation in chest; pulse small, slow, and weak.

Digitalis.—Pericarditis, with copious serous exudation; violent, but not very rapid beating of the heart, irregular intermittent pul brickdust sediment in urine, during or after rheumatism. Very feeble, irregular action of heart, with feeble, small, intermittent pulse; great prostration, fainting on the least movement, even lifting the arms, with palpitations, coldness of limbs and body, and dreadful weak feeling in pit of stomach, with or without convulsions or syncope; profuse expectoration of bloody mucus, and vomiting of food; sensation as if the heart would stop beating if she moved, with fear of impending death; hydropericardium.

Eupatorium perfol.— Pain, soreness, and heaviness behind the sternum and in cardiac region, worse by the least motion or by turning the body around.

Ferrum.— Consecutive heart disease, especially from chlorosis and onanism, congestion to head, spitting of blood; palpitations, better from moving slowly about; pseudo-plethora, with hard, strong beating of the heart and throbbing in all bloodvessels; pulse full, hard, increased by exertion; soft bellows' sound at apex; nervous restlessness, must walk slowly about.

Gelsemium.— Cardiac neurosis. Feeling as if the heart would stop beating if she did not move about; a sensible motion of the heart, as though it had attempted to beat, which it failed fully to accomplish, and the pulse then each time intermitted, worse when lying down in bed, especially when lying on left side; excessive action of heart; stitching sensation in cardiac region, heart's action slow and feeble, the beats of heart cannot be felt, chills and pains in head; nervous chills, yet skin is warm, wants to be held that she may not shake so.

Glonoine.— Laborious action of heart, pressure in heart, as if it was being contracted; sharp pains in the heart; heart's action easily excited, violent palpitation, throbbing carotids, pulsating headache, worse stooping; purring noise in heart when lying, pulse intermittent, must have head high, worse when lying on left side; restlessness in limbs, must rise and walk.

Graphites.— Sensation like an electric shock from the heart toward the front of neck; constriction, pressure, or stitches in cardiac region; strong pulsation of blood in the whole body, but especially about the heart, increased with every motion; tremulous sensation through the whole body; lassitude, prostration; herpetic constitution.

Iodium.— Pericarditis in complication with croupous pneumonia; purring feeling in the region of the heart, violent palpitation, increased from the slightest motion, better while lying perfectly quiet on the back; fainting spells; sensation as if the heart were squeezed together; fluttering sensation in heart; constant, heavy, oppressive pain in cardiac region.

Kali bichrom.—Cold sensation about the heart, tightness of chest, dyspnœa; pricking pain in region of heart; pulse irregular, small, contracted, with nosebleed.

Kali carb.— Carditis, with stitching pain in cardiac region, frequent intermission of the beat of heart, intermittent pulse; impending suffocation, with inability to lie down; crampy pains, as if the heart were hanging by bands; systolic murmurs, second tick loud from pulmonary stagnation; insufficiency of mitral valves; ebullitions, with heat from abdomen to head; pulsations all over.

Kali hydriod.— Valvular defects after repeated endocarditis; darts in cardiac region when walking; intermitting beats of heart, with lancinations, cramps in chest, stupor, and loss of breath; greatly annoying palpitations; quick pulse, but varying every moment.

Kalmia lat.— Wandering rheumatic pains in cardiac region; shooting pains above heart, through to scapula; hypertrophy and valvular insufficiency, or thickening after rheumatism; paroxysms of anguish about the heart, dyspnœa, febrile excitement, pains in limbs, stitch in lower part of chest, right-sided prosopalgia; pressure like a marble from epigastrium toward the heart, with a strong quick heart-beat; every beat has a strumming, as if it would burst, along sternum to throat, third or fourth beat is harder, and is followed by an intermission; arms feel weak, limbs cold; weariness in all muscles, shuns all exertion.

Lachesis.— Pericarditis; deep sighing every few minutes; occasional fits of suffocation and fainting, pulse weak, often intermittent; stitches in left side of chest; palpitation and choking from the slightest exertion; constrictive sensation in cardiac region; palpitation, can bear no pressure on throat or chest, must sit up or lie on right side; numbness of left arm; worse after sleeping. Rheumatismus cordis.

Lachnanthes.— Neurosis cordis. Sensation as of a lump of ice in the cardiac region and back, somewhat relieved by pressing the chest together with both hands; stitches in heart, with great anxiety; boiling and bubbling in chest and cardiac region; while lying, feels beating of heart to the head; trembling of heart with great debility.

Laurocerasus.— Violent palpitation of heart, with very feeble beat, the heart's action itself is feeble; beating-fluttering sensation in cardiac region, gasps for breath, cold moist skin, pulse scarcely perceptible.

Lilium tigrin.— Cardiac irritability, nervous palpitation; pains dull, pressing, and heavy, as if the heart were grasped and released alternately; sensation as if the heart contained too much blood, which might be relieved by throwing up blood; pain, pressure, and fulness about the heart, with a feeling of coldness about the heart, but no indication of any organic lesion; trembling feeling about the apex of the heart, worse on talking; frequent sensation, as if the heart stopped, followed by a rush of the blood to the heart, and violent palpitations; amelioration by lying on left side.

Lithium carb.— Valvular deficiencies, worse from mental agitation, which cause a fluttering and trembling of heart; sudden shocks in cardiac region; rheumatic soreness in cardiac region; nervous palpitations, cardiac irritability; fluttering of the heart, distressing and painful in the heart, and as far as between the shoulders, extending upwards into the head where the throbbing is felt; the air on inspiration seems so cold that it is felt unpleasantly cold even in the lungs; prostration of the whole body.

Lobelia infl.—Slight deepseated pain in cardiac region; sensation of weakness and pressure in epigastrium, rising to heart; sawing sound about heart, with violent pains, diarrhœa, and vomiting; short sensation, as if heart would stand still, a deep pain above the heart.

Lycopodium.—Hydropericardium; trembling palpitation, pulsating tearing in the region of heart; sensation as if circulation would stand still, or ebullition of blood; palpitation of heart nearly every evening in bed; marked palpitation, with flatulence; acceleration of pulse, with coldness of the face and feet; neck drawn towards right side, stitches in left side of chest; typhoid symptoms.

Lycopus virg.—Morbus Basedowii; constricting pain and tenderness around the heart; action of heart tumultuous and forcible; first sound of heart displaced by a blowing sound of mitral regurgitation; beats of heart more distinct on right side of sternum; stitch-like pain in cardia or a throbbing pain; sensation of pressing outward in cardia, not painful; cardiac oppression; palpitation from nervous irritation, with plethora; cardiac distress most marked at apex, on awaking, after slight exertion; pulse feeble, compressible.

Manganum acet.—Strong, irregular, trembling palpitations, without abnormal sounds of heart; sudden shocks of heart and in left side of chest from above downward; pulse uneven, irregular, rapid, or slow, but always soft and weak.

Mercurius.—Weakness of heart, as if life was ebbing away, awakens with trembling at the heart, and agitation as if frightened; aching pain at apex of heart, extending upwards towards the base; cardiac oppression; palpitation on the slightest exertion.

Mercurius cor.—Heart's sounds dull and intermittent; tremulous undulating motion of the heart; præcordial anxiety; pulse small, rapid, feeble, and irregular.

Mercurius protoiod.—Suffocation about the heart, with nausea and dizziness; sharp pain about heart, taking away her breath; sudden spasmodic action of heart, as though it had jumped out of its place; pulse, weak, irregular, laboring.

Natrum carb.—Violent anxious palpitation of heart when ascending, and at night when lying on left side; pulse excited at night, with ebullitions.

Natrum mur.—The heart's pulsations shake the body; fluttering of heart, with a weak faint feeling, worse lying down; irregular intermission of the beating of the heart and of the pulse, worse lying on left side; irregular beat of the heart, at one time slow, then again quick, especially from the slightest motion; increased impulse of the heart, the beats strong, but clear.

Nux moschata.—Hysteria cordis; violent action of heart; feels as if her head would burst, and her heart be squeezed off; trembling fluttering of heart, as from fright; palpitation and fainting, followed by sleep; irregularity in heart's beat, pulse intermits sometimes so ong that it excites fear of death; nun's murmur in carotids; frequent trembling pulse; disposition to faint even from slight pains.

Nux vomica.—Hypertrophy of heart from portal obstructions; palpitation in frequent short paroxysms, with pulsating throbs in the direction of the heart, especially from mental emotions, protracted study, after eating highly-seasoned food; tired sensation of heart, with palpitation when lying down, frequent belching; dilatation of heart (weakened heart), with nervous palpitation, with nausea, inclination to vomit, and heaviness of the chest.

Oxalic acid.—Soreness and stitches in heart, from behind forward and from above downward; sharp darting in head and left lung, extending down to epigastrium; immediately after lying down in bed at night palpitation for half an hour, in older children.

Petroleum.—Cold feeling about the heart (*Lilium*, *Kali bichromi.*); heat; pressing on the heart and palpitations, pulse accelerated by every motion, slow during rest; violent trembling of the limbs, weak unto faintness.

Phosphorus.—Disease of right heart, with consequent stagnation; dilatation of the heart following endocarditis; fatty degeneration of heart; dyspnœa, tightness across the chest; great weakness, with inability to exert himself; palpitation from every motion, with rush of blood to the chest, especially in rapidly-growing youths; oversensitiveness to external impressions; congestion to lungs, tightness across chest, and tight cough; painless diarrhœa.

Phosphoric acid.—Nervous palpitations in children who grow too fast.

Phytolacca.—Chronic rheumatic endocarditis; shocks of pain in cardiac region, pain goes into right arm; awakens with lameness near heart, worse during expiration, cannot get to sleep again; heart's action weak (fatty heart), with constipation; great exhaustion.

Podophyllum.—Nervous palpitation, in consequence of excessive hepatic action; sensation in chest as if heart were ascending to throat; palpitation, with a clucking sensation rising up the throat, obstructing respiration; palpitation, from mental emotion or exertion, with rumbling in ascending colon; heavy sleep, fatigue on waking in morning.

Pulsatilla.—Nervous palpitation in young girls about the time of puberty; catching pain in cardiac region; better for a time from pressure of hand; rheumatic irritation of heart, the pains shifting rapidly from one part of the body to the other; constant chilliness; worse nights, especially after getting feet wet; burning in cardiac region; violent fits of palpitation, often with anguish and obscuration of sight.

Rhus tox.—Uncomplicated hypertrophy, from violent exercise; organic heart disease, with sticking pain and soreness; numbness and lameness of left arm; chest and heart feel weak after a walk; violent palpitations when sitting still; pulse sometimes quicker than the heart's beat, irregular; restlessness, must change position; always worse when keeping quiet.

Rumex.— Heart feels as if it suddenly stopped beating (*Gels.*), followed by a heavy throbbing through the chest; aching in heart, with throbbing of carotids and through body, shaking the bed; dyspnœa worse when lying, has to sit up; face red, puffed, worse about eyes, which are red and lustreless; burning in region of heart; prostration; violent dry cough, provoked by a tickling in throatpit; brown, watery, morning diarrhœa.

Scutellaria.— Irregular action of the heart, from derangement of the cardiac plexus; tremulousness and twitching of the cardiac muscles; oppression of the chest, with a sticking pain in cardiac region; sensation of throbbing about the heart, with flushed face; nervous disorders of heart, as palpitation, tremor, and strange sensations, from emotional excitement; reflex nervous irritation.

Secale cor.— Nervous palpitation; palpitation of heart, oftener at night, with contracted and frequently intermitting pulse.

Sepia.— Congestion of blood to the chest, with violent palpitations· an occasional hard thump of the heart; interruption of the beating of the heart, most after dinner; alarming, quivering motion; restless, fidgety; sensation of ball in inner parts.

Silicea.— Heart troubles from nervous exhaustion; violent hammering palpitation, after very quick or violent motion; palpitation while sitting, has to hold on to something.

Spigelia.— Rheumatic pericarditis. Undulating motion of the heart; indistinct beats of the heart, running one into another; tumultuous beating of heart in recumbent as well as in sitting positions, not synchronous with the radial pulse; spasms of the chest; suffocative complaints; tremulous sensation in chest and temples, increased by motion; tearing sensation in chest when raising the arms overhead and when touching pit of stomach; purring murmur during the beats of the heart; stitches in cardiac region; pulsation of carotids, with tremulous motion; great dyspnœa at every change of position; bright redness of lips and cheeks, changing to pallor during every motion; audible beating of heart, causing a pain that is felt through to the back; cutting pains from the heart to shoulders, as far as the head and arms; arthritic pain and stiffness in joints; dull stitches where the beats of heart are felt, and recurring with the measured regularity of the pulse; scraping in throat; affection of the tracheal and bronchial mucous membranes; systolic blowing at the apex; pulse irregular, strong, but slow.

Spongia.— Anuerisma aortæ; dry paroxysmal cough; worse lying down; rheumatic endocarditis; loud blowing with each heart-beat; attack of oppression and cardiac pain; worse when lying with the head low; stinging-pressing pain in præcordial region; violent palpitation; awakens at night with a sense of suffocation; violent gasping respiration; loud cough; great alarm; agitation and anxiety; valvu lar insufficiency; feeling of numbness of lower part of the body; trembling in all the limbs.

Stramonium.— Chorea cordis; beating of heart, so increased by motion he cannot speak for hours; trembling twitching murmurs, instead of regular sounds, consequent on fright.

Sumbul.— Nervous affections of the heart; rheumatic carditis; heart's impulse strong, jerking, especially after exertion or during digestion; action of heart full and sharp, strokes at times irregular, beating rapidly eight or ten times, then slowly (*Arn.*, *Spig.*); bellows' sound of the heart, with violent and irregular palpitations and flushes of heat in floods from the back; sharp pains, like a knife, in the chest; oppression in left chest; clogged sensation; worse on stooping; left arm numb, heavy, and weary, with sharp wiry shooting in fingers; hysterical mood.

Tarantula.— Great oppression of chest; panting respiration; palpitation of heart without any known cause; murmurs and beating of heart, with alternate acceleration and suspension of the movements of the heart; trembling and thumping of heart as from fright; præcordial anguish; the movements of the heart are not felt; suffocation; constant want of air; heart suddenly ceases to beat, and patient fears to die; sensation as if the heart turned and twisted round, with pain in chest and general perspiration; pain in heart as if squeezed or compressed (*Cactus*, *Lilium*); also in aorta, under the left clavicle and carotids, with violent throbbing of heart and arteries; rheumatic pains in chest, extending down to umbilical region.

Tobacco.— Lassitude, from muscular relaxation and dread of vertigo on moving; facial pallor or lividity; cold extremities; palpitation when lying on left side; diarrhœa and constipation; dark and scanty urine, alternating with polyuria; perturbation of senses; sudden præcordial anguish; oppression of heart.

Veratrum album.— Tumultuous irregular contractions of heart, forerunners of paralysis; intermittent action of heart in feeble children, with some obstruction to hepatic circulation; violent, visible, anxious palpitation, with fainting; pulse sometimes slower than heart-beat.

Veratrum viride.— Idiopathic and rheumatic peri- and endocarditis; violent fever; full, hard, bounding pulse; congestion to head, without delirium; throbbing carotids; constant burning pain, with oppression of the chest; sensation as of a heavy load on the chest; heart's action violent and tumultuous; respiration rapid, labored, and sighing; fainting and blindness when rising from lying, from sudden motions; patient feels best when lying quietly.

Vipera torva.— Violent pains in chest, with chilliness; swelling up of chest, with difficulty of breathing; violent congestion to heart; he tears his clothes open, with excessive sensation of sickness in abdomen; anguish about the heart; numbness and lameness of upper extremities.

Zincum met.— Severe pain in cardiac region; some swelling and great tenderness; feels as if a cap were over the heart; irregular spasmodic action of heart, occasionally one violent thump; violent pulsations of the bloodvessels, during the beat; pulse irregular, small, and weak, scarcely perceptible; affections of the cerebro-spinal centers.

RESPIRATORY DISEASES.

INFANTILE RESPIRATION.

In studying the diseases of the respiratory organs of the infant, we must not forget the fact, that the nervous connections are not so well developed and established as to expand the lungs in all parts at each inspiration. The respiratory muscles, like those of other parts of the infant body work spasmodically, and therefore the respiration is apt to be jerky, irregular and often very spasmodic, especially if the nervous system is suddenly and violently disturbed. This disturbance in the new-born takes place through impressions upon the sensory nerve filaments, *e. g.*, sudden jars, rough handling, pressure from colic, or too much food, cold air, friction, as in washing with soap, acrid excretions, currents of air on its face as breathing, tight bands, etc., in fact anything that impinges suddenly or severely on the sensory filaments. We must always remember that feeling is the first wide-awake sense in the infant. While it cannot see, hear, smell, nor taste to any great extent, it can feel, and that most acutely. This question of feeling has much to do with the first respiration or its absence.

The *first respiration* is a phenomena that has provoked much study and speculation. Why does the new-born infant respire? How is it brought about? Let us study the subject a little. The position of the fœtus in utero, *i. e.*, the head bent abruptly upon the breast, effectually closes the glottis so that the entrance of air into the trachæa is a mechanical impossibility. The increase of this flexion or "continued flexion," as Hodge styles it, during normal labor is a double safeguard to the entrance of air and water into the lungs of the child. Rotation, while it facilitates the passage of the head, is an additional barrier to the entrance of air into the lungs "Flexion" says Hodge, "continues to be augmented during the whole of the second, third and fourth periods of delivery; and after the completion of the last, extension suddenly begins *exteriorly* to the vagina, and is rapidly completed. As soon as the head is liberated, restitution ensues, owing to the neck which had been twisted during rotation, returning to its original condition."

If "extension" occurs before the extrusion of the head there is nothing to prevent air and fluids from entering the nasal fossæ, the larynx and trachea, and thus asphyxiating the child. It is very probable that many still-births are due to the premature extension of the chin and opening of the glottis. More attention should be given to the respiratory organs during birth, and in breech presentations the glottis should be compressed and extension prevented if possible.

The trachea, bronchi and nasal fossæ are open canals and as already stated, (p. 115) respiration is really being established before complete delivery takes place, by the air penetrating the nasal passages, as soon as the head is born. This is shown by the snuffling sounds made by the infant. The deep, full inspiration and prolonged expiratory cry come only after full delivery. The air forces its way into the open trachea according to the laws of natural philosophy, while the first entrance of air into the lungs seems purely mechanical. The irritation of the nerves of sensation in the nose, bronchi and chest produces the expiration. While ordinary respiration is usually considered involuntary, the first expiratory efforts seem decidedly voluntary. The child seems to attempt to resist the entrance of air, first into the nose, then into the trachea, and last of all into the air-cells, and these efforts produce, (1), the snuffling noise first heard, (2), then the coughing effort, and (3), the prolonged, forcible expiration we call the cry or "wail of the new-born."

Diseases of the respiratory tract in children are very serious and largely fatal. They rank next to diseases of the alimentary tract in importance, we will therefore consider them carefully in detail and in as exhaustive a manner as space will allow.

THE NOSE—DEVELOPMENT—ANOMALIES AND DISEASES.

In the normal state of things the air drawn in through the inspiratory movements of the chest, passes through the nose, the mouth remaining closed and the tip of the tongue resting on the hard palate. The majority of children do not open their mouths, while awake, in order to satisfy the ordinary demand for breath, though many sleep with their mouths open. But even when the mouth is open, the nose, if in a healthy state, gives passage to the greater part of the air used in respiration. The entering current of air is comparatively small in diameter at the nostrils, and presses chiefly along the inferior nasal meatus and the space between the inferior turbinated bone and the septum towards the nasal portion of the pharynx, passing behind the relaxed dependent velum into the larynx and the respiratory organs proper. It returns by the same route, in expiration, and it must be taken for granted that with every inspiration and expiration all the air within the nose is set more or less in motion. In case of an increased demand for respiration, the ordinary avenue, through the nostrils is insufficient; it is therefore enlarged, during inspiration, by the action of the levatores alæ nasi—an appearance that may be taken as a sign of dyspnœa. In its somewhat retarded passage over the ever-moistened, turbinated bones of the nose, the air grows warmer and reaches the deeper respiratory passages charged with an increased amount of moisture. Furthermore, the changes in the direction of its movement, which the current of air undergoes during its passage through the nose, causes a portion of the dust-like particles floating in it to be deposited on the extensive surface of the nasal mucous membrane. (Fraenkel).

Development.—During the first period of intra-uterine life, the nose does not exist; the nasal fossæ, which at first communicate with the mouth, separate from it gradually by the approximation and union of the two lateral parts of the palatine arch. At six weeks or two months, two small holes situated by the side of each other appear above the mouth; these are the commencement of the opening of the nostrils; very soon two slight projections arise above these openings; they are the first rudiments of the alæ of the nose, which arise by degrees, but are very incomplete; for during the whole of the intra-uterine life, it continues quite small and obtuse. While the progress of the formation of the nose is in operation, the nasal fossæ enlarge, particularly in height; they are also a little spread at the bottom, but continue very narrow at the superior part. The sinuses and cornua are formed without leaving anything but a very narrow space between them; the mucous membrane with which they are covered is very red and thick in the latter period of fœtal life, and it exhibits the same characters at birth. The frontal and maxillary sinuses do not as yet exist; they are not formed until a more advanced period.

Anomalies.—As has already been seen, the holes of the nose do not exist at first; their development may be impeded or suspended, and the child be born with an entire absence of the nose, or with a considerable flatness of this organ, which preserves through life the traces of this primitive formation; but its complete absence usually depends on the absence of the ethmoid bone; the two eyes, united together, are lodged in a cavity commonly situated at the place of the nose. M. de Larue has given in the *Vandermonde Journal*, the case of a monster, of the cyclops order, which presented the following appearance: The size of the head, was proportioned to that of the body; the forehead was very large, and occupied three-fourths of the face; not the slightest trace of a nose could be found; there appeared to be nothing more than an oval opening, situated horizontally at the place where the point of the nose should have been, six lines above the superior alveolar process. Neither the cerebrum nor cerebellum exhibited anything extraordinary; there was no olfactory nerve, and although the bed of these nerves existed, there was no ethmoid bone nor cribriform plate. (*Observation sur un monstre cyclope*, M. de Larue, *Journal de med. chir. and pharm.*, t. 7, p. 278).

Sometimes there is found in place of a nose a kind of prolongation, produced without doubt by the remains of the skin which ought to cover the nasal eminence. The nose may be prolonged in such a manner as to form a real proboscis descending below the mouth. An instance of this deformity is preserved by Dr. Garnier of Angers. Without being thus prolonged, the nasal eminence instead of being short and depressed, as is the case in infants at birth, already possessed the full form of an adult's nose, and bore a close resemblance to it; this premature development ought to be regarded as a species of deformity. Billard has seen an infant at birth, where the nose possessed the shape known by the name of aquiline. There have been examples of bifid noses, or, without being completely double, showing in a very maked manner, the median line which separates the two lateral parts of this organ.

The complete separation of the two portions of the nose may also be produced by the formation of tumors in the nasal fossæ, which date their existence from the earliest period of the formation of the embryo. Dr. Rosata Dimidry has given a very remarkable instance of this. On the 7th of September, 1830, a young woman, of the commune de Vaglie, canton of Brindisi, in the province of Lecce, was delivered of a girl, who exhibited a large-sized fleshy prolongation, extending from the nose over and below the mouth. An attentive examination satisfied Dr. Dimidry, that the nose of this child was bifid, being divided at the base so that the two portions were separated, and between them projected a tumor of the size of a goose's egg, closely adhering to the entire circumference of the nasal opening and the upper lip, before which it descended; afterwards becoming free, it was extended even to the lower lip, thus almost completely closing the opening of the mouth. At the upper part of this abnormal production appeared a nipple-like protuberance, and one of similar shape and appearance at the inferior part contiguous to the lower lip.

Dr. Dimidry ascertained that this tumor interfered with respiration by the complete closure of the nostrils, and the almost entire closure of the buccal opening; and not doubting but a complete asphyxia would ensue, which would be quickly mortal, he decided to remove the tumor by one stroke of the knife. The dissection of this tumor proved it to be enveloped by a prolongation of skin, and that its tissue had the granulated appearance of a glandular body.

Notwithstanding all the means employed to sustain this child, it could not be accomplished, and it died four hours after the operation. (*Anali di med. et chir. di Napoli*, September 1830). (Billard.)

There are also cases of closure of the nostrils by a membranous growth, though a far more frequent one is bending of the septum toward one side, generally the left. Bending of the septum implies a diminution in the calibre of the nasal cavity on its convex side, so that often there is but a very minute space remaining, and even slight swelling of the mucous membrane may be enough to induce complete closure. It rarely happens that the other side of the nasal cavity is uniformly widened. Frequently, and that not only in cases in which a very apparent S shaped bending of the septum is present, a point is also found on the concave side of the septum, at which the turbinated bones approach nearer than is normal to the septum, so that there is not complete compensation for the narrowing of the other side. In this way there is almost always a unilateral, and sometimes a bilateral nasal stenosis brought about by bending of the septum. (Accidental dislocations of the septum, as by fracture, etc., may produce the same results). Bony closure of the posterior nares may be present but it is apparently very rare. (Fraenkel).

CORYZA — ACUTE CATARRH — RHINITIS - - SNUFFLES.

Coryza is an inflammation of the mucous membrane lining the nasal passages. Simple nasal catarrh occurs in a sporadic and epidemic form, the first arising in most cases from a chilling of the body, dependant upon too low a temperature of the nursery or exposure to bad weather, chilliness of the extremities when wetted with urine, insufficient dress, exposure to a strong fire, or the light and heat of the solar rays, etc., while its epidemic occurrence is induced by undue quantities of ozone in the air, or by mechanical and chemical alterations of the same; for example by dust, in the firing up of a stove unused for some time, etc. The liability also to become infectious, by a contaminated breath is not to be ignored. A possible connection has been considered to exist between the coryza of the new-born and the vaginal secretions of the mother during birth, in the same way as ophthalmia neonatorum originates.

Symptoms.—In the infant at birth, the pituitary membrane is always very red, and very much engorged, and it possesses besides great irritability; for we often see children sneeze at birth immediately on the air coming in contact with this part. The membrane also secretes an abundant mucus at an early period, and it flows constantly from the nose in some children. Thus the sanguineous congestion, redness, irritability, and the abundant secretion of the pituitary membrane in young infants, demonstrate the great disposition in this membrane to inflame, and explains the frequency of coryza in new-born children. (Billard).

Frequent sneezing is the first sign of this affection and in a short time the secretion is poured out by the mucous membrane, clear and liquid at first, but after a few days, is glairy and opaque, until it finally assumes the properties of the normal nasal mucus. Its reaction is always decidedly alkaline, and the amount of soda it contains may increase so much as to produce a slight corrosive effect upon the upper lip and alæ nasi. These local signs, reddening and erosions, and the inflammation are intensely aggravated by the constant wiping, which the nursery-maid does not always perform in the most tender manner. So long as the catarrh is confined to the nasal mucous membrane, it is generally unattended with fever, but when it implicates the posterior nares and pharynx, the frontal sinus or the supramaxillary cavities, conditions which can only be ascertained in older children by inquiries, it becomes febrile, and is accompanied by severe pains in these cavities.

When the catarrhal inflammation of the Schneiderian membrane extends to the conjunctiva through the lachrymal canals, redness, pain, intolerance of light, in short, conjunctivitis catarrhalis becomes superadded, and when finally it passes along through the Eustachian tubes into the tympanum, tinnitus aurium, otitis, and dyscophosis come on. In other cases, the catarrhal inflammation travels downward, causing hoarseness and pain, and from thence into the bronchi, where it terminates in the pulmonary alveoli; or the stomach and intestinal canal become involved, when loss of appetite and vomiting of large quantities of mucus, or slimy diarrhœa will be superinduced. In older children, these conditions, even when all the enumerated complications become superadded are always devoid of danger; but in the new-born child and nursling a complete occlusion of the still narrow nares, by the tumefaction of the mucous membrane and the accumulation of the secretion rapidly ensues. The usually closed mouth must now be constantly open, its cavity becomes dry and the breathing loud and rattling. And if these children now attempt to nurse, or take the bottle, they experience great difficulty in breathing and are obliged to forsake the breast and food, hence their nutrition rapidly suffers, and emaciation supervenes. (Vogel).

It thus assumes a much greater importance in infants from the very considerable obstacle it opposes to respiration, becoming a serious and even a dangerous disease. It causes great distress and disturbance to the child, interrupting its sleep, interfering with the act of nursing and so impeding the function of respiration as to bring on slight and more rarely dangerous apnœic symptoms. It may undoubtedly occasion, in weak and debilitated children, more or less extensive collapse of the lungs, an accident which will explain the imperfect performance of the hematosic function in some cases where the only evident disease is this apparently insignificant one of coryza.

When simple coryza exists in connection with bronchitis and pneumonia, it adds to the severity of those diseases. In young infants and in weakly children of any age its influence upon the symptoms is often very marked. The effort to breathe through the nasal passages when they are partially or wholly occluded by the inflammatory swelling of their lining mucous membrane, or by abundant and viscid secretions, fatigues and wears away the strength of the child, exhausts its energies and renders it less able to resist the pressure of the sickness. But not only this;—as in primary coryza, the entrance of air into the lungs is impeded and the hematosic function is thereby interfered with, while at the same time the existence of an obstacle to the full inspiratory movement, in addition to that which exists in the lungs themselves from bronchial or pneumonic disease, cannot but assist in the production of that collapse of the pulmonary tissue, which has been found of late years to coincide so often with the bronchitis and pneumonia of young children, and especially with the former. The reason why coryza causes so much difficulty in young children is, that they persist in the effort to breathe through the nose in spite of the obstruction of the nasal passages. They seem to do this instinctively, not apparently having the power to carry on the act of respiration through the mouth, or but for short periods only at a time. The constant struggle to force the air through the nose, and the necessarily smaller quantity that reaches the lungs, are undoubtedly the two chief causes of the symptoms above described as occurring in the coryza of children. (Meigs & Pepper).

Inasmuch as the nursling is obliged for its proper nourishment, to suck with the mouth for a long time, the difficulty of breathing, due to closure of the nose, is greatly aggravated by every attempt to take the breast, soon reaching the point of suffocation, and obliging the child to quit hold of the breast almost as soon as it has commenced, for the sake of getting its breath. In this way such obstacles are interposed to the proper nourishment of the infant that the most serious danger to life may result from this apparently insignificant difficulty. (Fraenkel).

Pathology.—With catarrhal coryza, various cachexia manifest themselves in the nasal passages. Thus there is a chronic, scrofulous, syphilitic coryza, and, in very rare instances, a coryza produced by a contagious mucous discharge, in which the secretion is of a totally different nature from simple catarrh; sometimes even some of the bones are destroyed by necrosis.

Occlusion of the choanæ by thrush-spores also occurs in young children who suffer from thrush of the mouth, causing severe dyspnœa. (Vogel).

There is a severer form, in which there is associated with the mucous discharge, a pseudo-membranous exudation. The discharge is thin and often contains small, granular particles which seem to be the detritus of the false membrane, while at other times it is ichorous and even bloody. The false membrane can often be seen, upon examination of the nostrils in a strong light, to cover the mucous membrane in the form of thin adherent layers of a yellowish-white color. The alæ nasi, and sometimes the whole extremity of the nose are red and swollen, and the skin which is tense and shining presents an erysipelatous appearance.

Complications.—It should be borne in mind that coryza may be but a part of a general catarrhal condition. The author has seen this so prominent a feature of mucous membranes as to mask progressive hydrocephalus. These cases are symptomatic, the enlarging head diminishes the calibre of the posterior nares and by obstructing respiration, which with the coryza, renders it difficult, especially at night.

Treatment.—If oiling the nose with some unctious substance does not give relief, *Nux vom.* should be administered, but if there is no relief in twenty-four hours, give *Sambucus.* If there is a serous discharge from the nose, *Cham.*; if the coryza is aggravated in the evening, *Carbo veg.*; if it returns every time the child is exposed to cold air, give *Dulcamara.* (Croserio). Teste recommends *Sepia.*

The following remedies are of importance: (1). *Aconite, Ipecac, Samb., Tart. emet;* (2). *Bell., Cham., Hep., Ign., Merc., Sulph.*

To facilitate their selection, we give the following symptoms:

Aconitum.—This remedy is frequently introduced at first when there are febrile indications. It will often cut short an attack of catarrh when administered promptly.

Allium cepa.—The discharge from the nose is profuse watery and excoriating, and there is a corresponding lachrymation. Violent cough accompanies the coryza.

Ammonium c.—Dry coryza with stoppage of the nose, especially at night, and lachrymation.

Arum triphyllum.—Profuse coryza, the fluid discharged being burning and ichorous, making the nostrils and lips sore; feverishness and hot, dry skin.

Calcarea c.—This medicine may be appropriately given after *Chamomilla* when that remedy seems indicated, but fails.

Carbo veg.— If the coryza returns in the evening.

Chamomilla.— When there is a watery or mucus discharge. The child is quieted, and in fact relieved by carrying it up and down the room. One cheek red and the other pale. The child seems extra sensative to pain.

Dulcamara.— The child gets worse at every cold change in the weather or from exposure to cold air. Dry cough.

Euphrasia.— Profuse fluent coryza and acrid lachrymation; the eyes are much involved. Ulceration of the margins of the eyelids.

Hydrastis.— Watery excoriating coryza; burning in the nose; more the right nostril; discharge scanty in the room, profuse out of doors; secretion more from the posterior nares; thick tenacious.

Kali bich.—An invaluable remedy when the discharge from the nose is tough and stringy; sometimes it seems to extend to the throat, and to cause choking.

Mercurius.—The nostrils are red, raw and ulcerated. Frequent sneezing and profuse fluent coryza.

Nux v.— The catarrh is worse at night, particularly toward morning or in the morning. Through the night the nose is very dry.

Pulsatilla.— Coryza much worse every evening, better in the morning. Discharge of yellowish green, thick and sometimes fœtid coryza. Worse toward evening.

Sambucus n.—The nose seems *perfectly dry* and completely obstructed. Very frequently indicated when the child "snuffles" constantly.

Sticta p.—There is a constant irritation in the nose to blow it, but no discharge.

Sulphur.— Fluent coryza, like clear water, and very profuse.

Tartar em.—Obstruction of the nose, and at the same time much rattling in the bronchi.

Nux, *Hepar or Kali bich.* have been chiefly indicated in the cases I have met. In bad cases the child should be propped up when asleep, and then the mouth will drop open. If the child cannot nurse, the milk may be given it in a spoon. For a few days the child may be oiled twice a day. If very subject to snuffles it should not be stripped and bathed only about once a week. When it has a cold it should not be stripped at all and not bathed except the soiled portions.

CHRONIC CATARRH. CHRONIC CORYZA. NASAL CATARRH.

This form of inflammation of the Schneiderian membrane is characterized by swelling and thickening of the mucous membrane as far as this can be seen, and by an accumulation of scabs and crusts, causing obstruction to the passage of the air, rather than by a discharge. The secretions are, in fact, not much increased in quantity beyond their natural amount, but they consist of very thick mucus, or they are purulent in character. This form of disease is met with in children over two years of age, and from that period up to puberty. Its principle cause, according to Meigs, seems to be some faulty state of the general health, some constitutional dyscrasia. Like keratitis and chronic otorrhœa of children, it makes its appearance without any evident exciting cause whatever, or it follows an acute attack of catarrhal inflammation from cold, or an attack of measles, scarlatina, or epidemic angina. It is sometimes met with in three out of four children of some families. Though it is unquestionably very apt to occur in lymphatic children, its presence is not necessarily a sign that the patient is of so-called scrofulous habit, since it is seen in families in which there is no such taint, and it is known that a good many of those affected by it, recover perfectly, and show no subsequent symptoms of the scrofulous or tubercular tendency. Its chief efficient cause appears to be a low state of the general health, the blood being more or less anæmical, and the nutrition of the body imperfect. In addition to the above it must also be borne in mind, as a fact of the utmost importance, that this form of coryza occurs frequently as a symptom of constitutional syphilis. (Meigs & Pepper.) It is frequently a result or complication of gastric catarrh.

Chronic catarrh of the nose is quite a frequent disease, and sometimes leads to inflammation and ulceration of the Schneiderian membrane, the formation of ulcerated crusts and other collateral ailments. It is particularly distressing to infants, and in their case may even occasion danger. It sets in with frequent sneezing, which is soon followed by the discharge of a clear and viscid, and afterwards yellow, greenish, purulent mucus. The infant is unable to nurse because it cannot breathe through the nose; it lets go of the nipple, and utters a piteous cry. It sleeps with the mouth open, and the more phlegm there is in the nostrils, the louder and more troublesome becomes the breathing, and the child becomes restless, cries and is exhausted. Such an acute attack is most frequently occasioned by a cold, but if the proper medicines, *Aconite*, *Chamomilla* or *Pulsatilla*, be at once given, the further development of the symptoms can be checked. (See Acute Catarrh, p. 617.) If the discharge should be suddenly arrested, the excessive dryness of the nose may be just as distressing and even dangerous to the infant as the opposite condition. Under such circumstances a little goose grease, sweet oil or butter may be rubbed on the nose, and the mucous membrane may be greased internally with a similar substance, and a dose of *Dulcamara*, *Sambucus* or *Nux*, *Chamomilla*, etc., may be given internally.

But this blenorrhœa may gradually go on to chronic inflammation and swelling of the nose, and cause a good deal of pain when blowing the nose. Gradually the discharge becomes purulent, especially in the morning, when the nostrils are stopped by hard crusts. On tearing off these crusts the secretion, which is of a watery, ichorous quality, is frequently mixed with blood, or else it is thick and greenish, has an unpleasant smell even to the patient, and the upper lip becomes œdematous, and the discharge from the nose makes it sore. On dilating the nostrils with the finger, the ulcers are distinctly seen. Children of from four to seven years old are particularly liable to this species of ozæna. It rarely terminates in caries, and the osseous affection always holds a secondary rank. The cartilages are more frequently involved in the destructive process. The front part of the nose including the tip, is generally the seat of the disease; this part is covered with ulcers, tubercles, crusts, it is swollen and inflamed. The eyes and lachrymal ducts are frequently involved. (Hartmann.)

The breathing is at all times nasal, and embarrassed. Even in the waking state, the child will sometimes attract attention by the noisy and slightly oppressed character of its respiration, while when asleep, the obstruction to the passage of air through the nasal passages will be so great as to give rise to symptoms which though not alarming are most annoying to those around. The obstruction to the passage of air through the nasal passages produces snoring or hissing sounds, which are sometimes so noisy as seriously to disturb those sleeping in the same apartment. This obstruction often obliges the child to make greater muscular effort than in the healthy state, to supply the thorax fully with air, so that the sleep instead of being quiet and easy as in health, is broken and disturbed by the unusual play of the muscles, and by the disordered internal sensations caused by the reaction upon the nervous system, of a fluid less thoroughly decarbonized than it should be. The child tosses and rolls, sighs and moans, or it cries out in its sleep, or it wakes suddenly and frequently. When the nasal passages are examined by a full light, they will be seen obstructed in two ways, by a thickened and injected state of the mucous membrane, and by the presence in them of scabs, or of inspissated masses of mucus or muco-pus. The mucous membrane is also redder and more highly vascular than natural, and sometimes exhibits an appearance in some points as though excoriated or slightly eroded. There is seldom, indeed, rarely any considerable amount of fluid secretion, as in acute coryza; the secretions are so much more viscid than usual that they dessicate in the passages, and form scabs and crusts. Not unfrequently the surfaces become so irritable as to bleed very easily. The act of blowing the nose, a rude touch, or a blow, will cause a considerable discharge of blood, and this is often the symptom for which the practitioner is particularly consulted. The voice of the child is characteristic; it is nasal, and when the obstruction is considerable this becomes a marked symptom. The general appearance of the patient almost always shows a deteriorated state of the general health. His color is too pale, the skin is muddy, the expression is languid; the tissues are more flabby and flaccid than they ought to be; and the movements are less brisk and prompt than in full health. Such patients wake from their sleep less refreshed than is natural; their appetite is often capricious and poor; and the digestive and nutritive functions are impaired. The tongue is often flabby in texture, pale and more or less furred, the bowels are irregular, and the discharges often scanty, and of an unhealthy color and smell, or there are alternations of diarrhœa and constipation. (Meigs & Pepper.)

Complication.—The most common of these are cerebral affections. From the proximity of the brain and the thinness of the walls, the inflammation may readily be transmitted to the meninges, and hydrocephalus follow. Drowsiness, prostration and sometimes convulsions are grave and significant symptoms. Meigs mentions a case, in which there was effusion of serum in the cavities of the peritoneum and pleuræ.

Treatment.—In young infants there is obstruction to the full freedom of the respiratory act, interfering with the suckling, and causing sleep to be broken and restless. In such cases the child should be kept warm and the nasal passages lubricated by the occasional introduction of a camel's hair pencil charged with *Glycerine* diluted with two parts of water, or sweet oil.

Among the remedies which ought to be used for this disease, the following are the principal.

Asafœtida, the same as *Aurum*, although these two remedies act better when the ozæna is complicated with a syphilitic taint.

Aurum is eminently useful for crusts and ulcers of the nose.

Belladonna 30th, will frequently have to be given before *Mercury* and *Hepar* after *Belladonna*, if the inflammation should be very painful and acute, but this is not a positive rule, and may have to be modified.

Calcarea iodum has cured cases in children of a decided lymphatic constitution, when there was also destruction of the cervical lymphatics and enlarged tonsils.

Hepar sulphur 30th, will, after *Mercurius* be found valuable. With it, Hartmann cured a number of scrofulous ulcers of the mucous membrane resembling chancres, and this induced him to believe that it must be a useful remedy in this form of ozæna.

Kali bich. is a prominent remedy for this form of catarrh. The crusts and plugs that are ejected in the morning, and the dropping from the posterior nares, causing gagging and vomiting, are the chief symptoms. Older children may also complain of a sense of tightness at the root of the nose.

Mercurius solubilis 12th, when the inflammation and ulceration, the fœtid purulent discharge has reached the highest degree of development; the upper part of the nose is likewise affected. It should be dissolved in water, and a portion of it be taken morning and night. If this should not affect a cure, nothing will have been lost for the *Mercury* will have had the effect of increasing the susceptibility of the organism to the action of the remaining necessary remedies.

In addition to these medicines we may mention *Sulphur*, *Calcarea*, *Phosphorus*, *Lachesis*, *Bryonia*, *Nitric acid*, *Rhus tox.*, *Pulsatilla*, *Hydrastis*.

Dr. Simons reports cures with *Hydrastis* and *Calcarea* in alternation.

For chronic catarrh the most reliable remedies, according to Jahr, are *Sulphur*, *Calcarea* and *Silicea*, or even *Cyclamen*, especially if there is a good deal of sneezing.

Consult Acute Catarrh, Polypi, Abscess, etc.

EPISTAXIS. BLEEDING OF THE NOSE. RHINORRHAGIA.

Epistaxis, as, in fact, all hæmorrhages, is produced by a rupture of vessels; in this case of the capillaries of the nose. The causes are divisible into local and general. The local are injuries of all kinds, blows, contusions, lacerations, etc. Still, even here, the individual disposition is not to be lost sight of, for the various injuries produce entirely different effects, according to the existing disposition to bleed from the nose. A local causation is also found in the various forms of ulcerations of the mucous membrane. To the general causes, all conditions which are combined with stasis of the venous circulation belong, such as cardiac malformations, goitre, the so-called general plethora, pneumonia and typhus fever, and particularly the diseases in which actual disturbances of the capillary system of vessels are superinduced, such as scorbutus and morbus maculosis, and diseases of the blood like chlorosis. Finally vicarious hæmorrhages occur in girls at the time when menstruation should take place.

Symptoms.—The blood either makes its appearance in drops, as in stillicidium sanguinis — the ordinary form — or it flows in a continuous stream, rhinorrhagia, a rare and exceptional form. As regards the quantity of blood lost, we are often unintentionally deceived by the relatives, for they forget that the child has bleed into a vessel containing water, and, when they behold the dark red-colored water, imagine it to be blood.

Children under three or four years very rarely suffer from epistaxis from general causes, but only in consequence of injuries or ulcerations, in which the hæmorrhage is never profuse. In older children all the above mentioned causes are to be taken into consideration. In children laboring under febrile diseases, it occasionally happens that the blood flows backward into the pharynx, and is swallowed, when hæmatemesis may occur, or black, or more or less bloody stools be voided. Usually, the bleeding does not last an hour; in exceptional cases however, it may be protracted for half a day.

Its pathological significance is naturally very different, according to its severity and etiology. Epistaxis is to be regarded as a favorable phenomenon in all febrile affections, in venous congestion, and in expected menstruation; as unfavorable, and tending to aggravate the condition, in scorbutis and chlorosis. (Vogel.)

Epistaxis is an event occasionally happening in the course of bronchial phthisis, and is due to the obstructed return of venous blood.

Treatment.—This must be exceedingly variable. In scorbutus and chlorosis it must be arrested promptly. When occurring in the other states just mentioned, the best method of arresting the hæmorrhage is to introduce a few bits of ice of the size of a pea into the nares, and then plug these up with a good sized charpie tampon. Tamponing the posterior nares is very annoying to children and is attended with a great deal of difficulty, and should only be resorted to in extreme cases. Elevating the arms above the head is a popular, and often effective method. Also putting something cold between the shoulders.

A simple and effective method is to chew a piece of paper, and insert it under the upper lip just where the facial artery has its outlet. If the child is old enough it may chew the paper and hold it in position itself. The principal remedies are: *Bell.*, *Arnica*, *Ham.*, and *Ledum*. Dr. Shipman generally depends upon the latter.

The indications for the various remedies are as follows:

Aconite.—Epistaxis from excitement or passion. Arterial congestive bleeding. Copious epistaxis with fullness in the head.

Aloes.—Nose-bleed in bed after waking up.

Ammon. carb.—Epistaxis in the morning; after washing the face with cold water; bleeding of the nose after dinner.

Argentum—With crawling and tickling sensation in the nose.

Arnica.—Epistaxis from a blow or other external injury. Preceded by a sensation of crawling in the nose and forehead.

Arsenicum.—Nose bleed after vomiting or a fit of passion, great heat and restlessness.

Belladonna.—When preceded by throbbing, congestive headache, redness of the face, and brightness of the eyes. Blood flows freely, even from both nostrils, drop by drop. Sparks before the eyes; noise in the ears, fainting. Worse from motion, noises and bright light.

Bryonia.—After being overheated or in anæmia. In the morning after rising, worse from motion.

Carbo veg.—Frequent and continued nosebleed, especially in the morning and forenoon, or when pressing at a stool; great paleness of the face during and after the bleeding. Profuse and long continuing; small intermitting pulse.

Calcarea phosphoricum.—Abundant epistaxis afternoons.

China.—Nosebleed in anæmic persons, with fainting; ringing in the ears. When weakness results from loss of blood.

Conium.—Frequent bleeding from the nose after sneezing.

Crocus sat.—Discharge from one nostril at a time, of tenacious, thick, dark, black blood, stringy, with cold perspiration on the forehead.

Erigeron.—With rush of blood to the head, red face and fever. Bright red blood; (also *Erechthites.*)

Hamamelis.—Blood oozing slowly drop by drop, not bright red; in combination with hæmoptysis.

Indigo.—With dry cough.

Kali carb.—Children with puffy balls over the eyes; every morning at nine o'clock.

Ledum.—Bleeding from the nose. The blood is pale.

Merc. sol.—Blood coagulates in the nose, and hangs down like icicles.

Millefolium.—Red blood flowing without apparent cause.

Moschus.—Spasmodic jerking of the muscles.

Nux vomica.—Congestion of the head, pain in the forehead, constipation, suppressed hæmorrhoidal flow.

Phosphorus.—Bleeding from the nose when there are bruise-like marks (ecchymosis) on the body.

Pulsatilla.—Vicarious menstruation at puberty.

Rhus tox.—At night or when stooping, discharge of light colored blood sometimes coagulated.

Rumex crispus.—Epistaxis with violent sneezing and painful irritation of the nostrils.

Secale.—Epistaxis with great prostration and drawn features.

Sulphur.—Blood comes from the nose whenever blowing it; bleeding of the nose, with vertigo, afterwards it feels sore when touched.

Thlaspi.—Frequent occurring epistaxis of a passive nature.

Veratrum alb.—Deathly paleness of face; coldness of body; slow intermitting pulse.

In the case of plethoric young people, Jahr says: I always first resort to *Aconite*, generally with the best results. In the case of young girls whose menses had become suppressed, I give *Bry.* or *Puls.* (also *Hamamelis*). If these remedies do not help, and the patient complains of a good deal of vertigo, obscuration of sight or buzzing in the ears, I generally resort to *Bell.* or *Nux vom.* If the face is very pale, the following remedies help beside *Bell.*: *China*, *Carbo veg.* and *Verat.*

alb., the last named remedy is more especially indispensable if fainting fits, and a general coldness of the extremities supervene, and *China* does not relieve this condition. If the bleeding is preceded by a good deal of tingling in the nose, and *Bell.* affords no relief, *Arn.* or *Rhus tox.* often helps. *Cina* sometimes arrests the bleeding in the case of children who are affected with worms. In violent hæmorrhages that cannot be arrested by any remedy, *Croc.*, *China*, *Carbo veg.* and *Sepia* often help, (also *Hamamelis virg.*) If the epistaxis occurs among debilitated individuals, *Carbo veg.*, *Secale* and *Veratrum alb.* often prove very useful beside *China.* If the bleeding is excited again by the least stimulating or heating cause, such as wine or any other cause, *Aconite* is the first most efficient remedy in such a case, after which very often *Bry.* or *Nux vom.* If the bleeding sets in more particularly in the evening, *Puls*,; if at night besides, *Merc.* or *Ars.*, sometimes *Bry.* or *Rhus tox.*, and if it occurs more particularly early in the morning beside *Nux vom.*, sometimes also *Bry.*; when occurring after a blow or fall on the nose, *Arnica* or *Sepia* ; after stooping or other exertions, *Rhus tox.* and *Carbo veg.* Upon the whole I pay very little attention to the color and quality of the blood, for the reason that, if the drug was otherwise indicated by the symptoms I have obtained equally favorable results, let the quality of the blood be what it might. If all the other symptoms correspond, I of course prefer *Arn.* and *Bell.* if the blood is bright red and fluid; *Crocus* if it is dark, and beside *Croc.* I prefer *Merc.*, if the blood coagulates readily.

Teste says, the medicines to which we should have recourse, are *Arn.* and *Phos.* The first is given in potion or in globules, two or three days in succession, from the sixth to the twelfth dilution; *Phos.* should only be prescribed in the case where *Arn.* has failed. In very abundant and prolonged epistaxis, the two medicines should be administered alternately in the same day.

Gilchrist says, "in cases of epistaxis of almost any kind, *Erigeron* has never but once failed me. I use the strong tincture, and administer it by olfaction. One or two smells of it has always sufficed."

Boenninghausen recommends *Thlaspi* as one of the most efficient remedies.

FOREIGN BODIES IN THE NOSE.

Children from two to eight years of age very frequently introduce extraneous substances into the nose. The most common are cherry-pits, small round pebbles, glass beads, peas, beans and paper balls. In addition, insects, such as flies and bugs, gain an entrance into the nose while children are asleep, or a round worm strays (probably during a fit of vomiting) into the nose. Generally as soon as a child introduces a foreign body into the nose, it tries to remove it by boring with the finger, and thereby only pushes it into the chonæ, where it finally becomes lodged. The irritation produced by these foreign bodies varies according to their composition. If some part of the surface is rough, painful swelling and coryza will soon be induced; beans and peas produce the greatest amount of irritation, they soon swell up in the warm, moist cavity, and may even begin to sprout there. A remarkable case of this kind is recorded by Boyer, in which a pea germinated in the nose of a child and bore ten or twelve roots, one of which grew to three and a quarter inches in length.

The nose becomes very painful, and without *Chloroform*, no thorough examination can be made. The termination is most favorable in those instances where paper balls have been introduced into the nose; they soon soften and are discharged piecemeal. However, cases are also said to have occurred in which the foreign bodies produced severe irritation, delirium, meningitis, and death. The condition known as rhinolites, in which successive deposits of inorganic salts take place around the foreign body, sometimes met with in adults, is unknown in children. (Vogel).

Treatment.— A painless and yet in many instances a successful remedy is, the act of sneezing, which may be excited by a pinch of snuff used in the sound nostril. Even when the extraneous body is not entirely expelled, it will nevertheless always be found to have been propelled forward and somewhat loosened. As soon as it becomes visible, it may be extracted with a very fine dentated forceps or Daviel's scoop. Soft bodies may also be crushed with a strong dentated forcep, when the single pieces will soon be expelled. The attempts at extraction should never be persevered in too long, because very severe swelling of the mucous membrane will thereby be produced. They may be repeated again in a few days. Under no circumstances is the nose to be split open hastily, as has been recommended; the operation should be deferred until critical cerebral symptoms render it necessary, which on the whole very rarely occur. (Vogel). Another very convenient and popular method is to use a fine hair-pin which will usually engage the body so as to extract it. It is well to remember the anatomy of the nose and pass the pin above the obstruction or towards the outside pressing the body downward and inward or outward if near the entrance. After removal it is well to give the child *Arnica* or *Aconite*, as the irritation or fright may indicate.

TUMORS IN THE NOSE—POLYPI.

Polypi, the only adventitious formations in the nasal passages in children, are of less frequent occurrence than in adults and are rarely met with before the sixth year. The youngest child in whom it existed in Vogel's experience was four years old. The resemblance of the tumor to the animal of the same name may have been found in the method of their attachment or in the appearance of the flesh.

There are two varieties, either mucous, sometimes known as *soft* polypi from their soft and delicate consistence; or they are formed of connective tissues in the form of fibrous or fibro-sarcomatous polypi, going sometimes by the name of *hard* polypi. The former proceed from the mucous membrane, and are limited to it, whilst the fibrous polypi grow from the periosteum, frequently from the base of the skull, and gradually extend by growth in various directions, sometimes upwards to the floor of the orbit, backwards and downwards to the throat and larynx, or outwards to the cavity of the jaw, and they generally have a broad base. (Steiner).

The so-called *mucous polypi* are of most frequent occurrence. They retain the elements of the mucous membrane from which they arise and the epithelium, which still covers them; the only difference lying in the fact that sometimes the glandular element and sometimes the connective tissue predominates. Generally, however, they consist of newly-formed hypertrophic glands, which are held together by soft—frequently œdematous—connective tissue. In this case they deserve the name of adenomata. More rarely forms occur, which, according to their anatomical structure, must be designated as œdematous fibromata or as sarcomata. They are either pedunculated or attached by a broad base, may be single or multiple, and vary in size from small excrescences like condylomata to extensive tumors which project into the nostrils or extend through the posterior nares into the pharynx. (Fraenkel).

The theory has generally obtained that polypi originate from chronic catarrh, but according to Vogel it rests upon feeble foundation, considering that their rare occurrence in children speaks against it, because in these the mucous secretion is much greater, even in the physiological state, than adults. On the other hand, those cases coming under his notice had no preceding catarrh. It would seem that there is a constitutional tendency to this form of growth.

Symptoms.— Nasal polypi do not produce much disturbance as long as they remain of moderate size ; but when the increase of size is so great that the nostrils become plugged up, various symptoms are excited. Among these are irritation of the nasal mucous membrane with excoriations, hæmorrhage, loss of power of smell, a peculiar nasal tone of voice and breathing through the open mouth, interference with hearing, swallowing and chewing, lachrymation, difficulty of breathing, paroxysms of coughing, and frequent puffing and blowing to make a passage for the air. (Steiner).

Now and then one of the cystic polypi, through the violent snuffling and pressure will burst, the contents be discharged, and the air once more pass freely through the nares. But as cystic polypi usually exist in numbers, the smaller ones rapidly follow in growth, occlude the passage anew, and the old condition is reproduced. Firm sarcomatous polypi are also capable of blocking up the lachrymal canal and the Eustachian tube and thus produce stillicidium lachrymanum and hardness of hearing. In cystic polypi this is not observed. In both forms a mucous or purulent coryza, and even ulceration of the mucous membrane, may take place as a result of which small hæmorrhages also occur. Polypi may produce asthma, either by means of reflex action, or, by hindering breathing bring about an alteration in the chemistry of respiration and the texture of the lung tissue. (Fraenkel).

Diagnosis.— The diagnosis is readily made out when the polypi reach the margin of the nares or even protrude. When this is not the case, the impermeability of the cavity in question may be readily ascertained by compressing the opposite one, and causing the patient to blow his nose. (Vogel). There is a possibility of nasal polypi being simulated by hernia of the brain, making it necessary to be on one's guard against this chance of error in case of congenital tumors. The diagnosis is determined by the presence of a bony canal and the possibility of a partial or complete replacement which is usually of easy demonstration. Hypertrophy of the tonsils may mislead in the diagnosis.

Treatment.— This is divided into medical and surgical. Lilienthal says that the oft recommended *Teucrium* is of little use, but that *Pulsatilla* is the chief remedy of which four doses 3-30, one dose every four days, then a dose of *Calc. carb.*, whose action should remain undisturbed for six or eight weeks, or longer, and if this does not help, *Sanguinaria.*

The author has cured a case with *Teucrium.* Several cases are also on record as cured with this drug. Other remedies are *Kali. bich.*, *Hydrastis*, *Phos.*, *Sepia*, *Silicea*, *Staph.* *Calc. phos.* has cured cases. (See Gilchrist's Surgical Diseases).

The surgical treatment consists in twisting off the growth by certain instruments. Long, slender, serrated forceps are frequently used for this purpose. When the pedicle can be reached by the scissors, that method of removal has been recommended. The late Dr. G. D. Beebe preferred short bullet forceps, passing these into the nostril and snipping, as long as any growth remained. He thought there was no danger in injuring the parts.

ABSCESS OF THE NOSE.

Abscess of the Septum comes occasionally, though not frequently, under observation, and may occur in an acute or insidious form, the latter especially in dyscrasic children. When the nostrils are examined, a flattish-round tumor of greater or less size will be observed, which fluctuates and is painful on the slightest touch, and the septum will be found displaced to one or other side. The pain and the obstruction to breathing makes the affection a very troublesome one. Sooner or later the abscess discharges spontaneously, though in scrofulous children this may be long delayed, aud may be followed, as in one case which came under my notice by perforation of the septum. The causes of these abscesses may be catarrhal, traumatic, or dyscrasic.

In the diagnosis care must be taken not to mistake the disease for polypus, but, as a rule, the pain will prevent any such confusion.

Treatment.— This consists of the application of poultices to the nose, the insertion of emollient substances into the nostrils, and the early evacuation of the abscess, and when there is suspicion of some dyscrasia that must be treated, especially if there be any affection of the bones. *Hepar* if simple abscess; if syphilitic, *Aurum*, etc. (See remedies for Chronic Catarrh.)

Abscess of the Antrum in the superior maxillary bone may occur in the child as well as in the adult. The orifice may be occluded by inflammation of the mucous membrane of the nose or the root of one of the eyes (canine) teeth may ulcerate and discharge into the antrum which inflammation in turn may occlude the orifice and then break into the nostril. The swelling of the jaw will usually settle the diagnosis. For treatment (see Abscess of Septum and Palatal Abscess, p. 224.)

HAY FEVER, AUTUMNAL CATARRH. CATARRHUS ÆSTIVUS.

This is supposed to be a rare disease of child life, yet I have met it as early as in the second year.

It is ushered in during the month of August like an ordinary attack of severe coryza, with profuse discharge of water from the eyes and nose. It also invades the throat and chest, and is attended with feverish symptoms. In addition to the catarrhal symptoms there is a spasmodic complication both of the nose and throat as well as of the bronchi. The ones attacked are usually the nervous and nervo-sanguine, and generally of a consumptive tendency.

The cause as far as I can ascertain, is a cold contracted during the first cool spell in August. and which is aggravated and protracted by the heat and dust of the days and coolness of the evenings. The predisposing cause is the peculiar sensitiveness of the individuals attacked. The depression incident to the hot days no doubt deranges the nervous energies of these sensitive subjects, and the normal character of the nasal secretion.

The *symptoms* are exceedingly variable. The nervous cases have the catarrhal symptoms alone, unless there is an asthmatic tendency in the family, while the nervo-sanguine persons have the fully developed disease, *i. e.*, the catarrhal and asthmatic symptoms combined.

The disease usually has a prodroma from a week to two months, although some cases report themselves well before. The first coryzal symptoms are ushered in violently and last about a week before the throat becomes involved, and later the asthmatic phase appears. In old and fully developed cases, the asthmatic symptoms may appear very early. The disease runs a course of about six weeks, but may be prolonged for months. The sequelæ are long-lasting attacks of asthma, a persistent cough, or a derangement of the alimentary tract.

Treatment.—The first child that I treated had the catarrhal symptoms, and was promptly relieved with *Arum mac.* 30. The next year the attack was more severe and the lungs became invaded. *Arum* 2 and *Euphorbium* 2 afforded no relief, but rather seemed to aggravate. *Arsenicum* finally cut it short. Possibly had I given the first remedies high, as prompt a result might have been obtained as in the previous year. These cases are sensitive and need only a little of the medicine indicated. Another child, aged seven, with the asthmatic type of the disease was promptly relieved with *Ipecac.* A prominent symptom in the case was "a persistent nausea."

The type of the disease, whether catarrhal (nasal) or asthmatic, and the peculiar symptoms of each case must govern in the selection of the remedy. The year seems to have a marked effect on the disease and the remedy.

I have made a large collection of cases of Hay Fever * and believe that it is a perfectly curable disease. The selection of one of the following remedies will usually be needed for the catarrhal type *Arum m.*, *Euphorbium*, *Euphrasia*, *Arsenicum*, *Rhus*, *Natr. sulph.*, *Sulphur.*

For the asthmatic type, the selection will usually be between *Ipecac*, *Arsenicum*, *Belladonna*, *Grindelia*, *Sulphur*, *Hepar.*

For the sequelæ, *Nux*, *Bryonia*, *Kali*, *Ars.*, *Sulphur.*

Locally for the eyes, *Fœniculum* has been valuable; and for the burning in the throat gargles with water, or a solution of *Merc cor.*

Compare remedies under Coryza and Asthma.

As a prophylaxis *Arsenicum iod.* 200 has worked nicely. The disease growing more mild each year, and finally disappearing. The child should be kept out of the air unless outdoor air relieves as it sometimes does. Cold water or warm to the nose and eyes, and gargles of hot water afford relief. In the nervous cases warm is better than cold.

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* See forthcoming work on Hay Fever and its Homœopathic Treatment.

DISEASES OF THE PHARYNX.

The pharynx is common to both the respiratory and the alimentary tracts, but its diseases, aside from those due to accidents, as burns, etc., are usually met when respiratory diseases chiefly prevail. Its peculiar anatomy has greater reference to the wants of respiration than to those of deglutition. It is therefore worthy of careful study.

DEVELOPMENT AND MALFORMATIONS.

The pharynx is only to a limited degree provided with a bony framework. Above, at its roof, it is formed of the body of the sphenoid bone, and the basilar process of the occipital. These bones are covered on their inferior surface with a stout layer of tense connective tissue, arranged in parallel strands which also equalizes the differences of level of the neighboring portions of the base of the skull—the fibro-cartilago-basilaris, so called not because of its containing cartilage cells which are not present here, but because of its dense construction, cartilage-like in hardness, and its almost hyaline appearance.

At the anterior portion of the upper section of the pharynx, there is in the centre, the vomer, with its processes diverging upwards; to the side, the inner plate of the pterygoid process of the sphenoid bone; below, the horizontal plate of the palate bone; all of which together compose the boundaries of the chonæ. The posterior wall in its entire length, rests upon the cervical vertebræ, as far down as the sixth, (inclusive.) The true walls of the pharynx are principally formed of three layers; mucous membrane, muscles, and the facia surrounding them. (Wendt.) This musculo-membranous sac or bag is wider above than below, and is suspended from the base of the skull, in front of the vertebral column, behind the cavities of the nose, mouth, and larynx, with all of which it communicates. The muscular layer of the pharynx consists of three pairs of so-called *constrictor* muscles, named from their relative positions superior, middle and inferior and overlap each other from below. (Marshall.) The upper part of the pharynx has its mucous membrane covered in the infant, with ciliated epithelium, while in the adult body this is replaced by the flattened species. The mucous membrane of the pharynx is very vascular and abundantly supplied with glands and lymphatic canals. (Frey.)

Congenital Malformations.—On examining the dead bodies of children, the pharynx has sometimes been found very narrow. This might lead to the belief that it was the result of a state of contraction in the constrictor muscles, but the base of the tongue was also narrowed, and the cornua of the os hyoides were approximated, so as to render it probable that this narrowness depended on a malformation. If it exist to a great degree, the effect is a considerable difficulty in swallowing. If therefore a young infant exhibit much difficulty in swallowing the milk which it drinks or sucks, before concluding that this is an evidence of a phlegmasia of the organs of deglutition, it will be necessary to examine with attention the form of the tongue, the narrowness of which is almost an evidence of the narrowness of the pharynx. This examination is not without its utility, because the physician can then confine his treatment to advising that drinks be given with caution, and in small quantities at a time; while in the former case he ought to use all the means in his power for the treatment of the inflammation. (Billard.)

Hyperæmia or Sanguineous Congestion of the Organs of Deglutition.—The veil of the palate, and the isthmus of the fauces in young children are almost altogether injected and red. The pharynx is generally in a high state of congestion, and this congestion is the more considerable in proportion to the nearness of birth. It is not known to what cause to attribute this condition, and attention is called to it, because it may very easily be mistaken for an inflammation of these parts. In an examination of two hundred children, aged from one to ten days, that had died from various diseases, Billard found the isthmus of the fauces injected in one hundred and ninety. This injection was generally spread in a uniform manner, but sometimes it appeared in the form of ramifications more or less distinct. There was not found in any relation worthy of note existing between it and the intestinal canal; but this was not the case with reference to the duration and intensity of the congestion, and the redness of the integument which exists in young infants during the first eight or ten days of their life. There appeared to be an intimate connection between the vascular system of the skin, and that of the mouth and isthmus of the fauces, since these parts exhibit at the period of birth a sanguineous congestion, the duration of which is the same, and for the existence of which there appears to be no pathological cause, and appears in all infants under all circumstances. This will bring to mind the analogy of sensibility and irritability that authors have recognized between the cutaneous system and the mucous membrane of the throat, an analogy which demonstrates in a very evident manner the development of an anginose affection at the commencement or during the progress of certain cutaneous phlegmasiæ. (Billard.)

PHARYNGITIS. INFLAMMATION OF THE PHARYNX. FOLLICULAR PHARYNGITIS. COMMON SORE THROAT.

Children of all ages are liable to inflammation of the pharynx; in its mildest forms, it often, no doubt, escapes detection, but on the other hand it is sometimes difficult to recognize inflammation of these parts in young infants, as the ordinary aspect of the state of congestion has a great resemblance to redness of inflammation. (See diagnosis.)

Etiology.—Pharyngitis may be primary or secondary, the latter when it occurs during measles, scarlet fever, bronchitis, croup, pneumonia and some other affections. It is more frequently a secondary than any idiopathic affection. The exciting causes of the disease are not always easily detected, but in most instances exposure to cold is the cause of the attack, particularly in early fall or late spring. Occasionally it results from the use of drinks that are too hot, or contain some irritating substance. Boiling water accidentally swallowed, or the injection of strong acids, lye, ammonia. etc., also produce it.

Anatomical Appearances.—The appearances presented by the throat, are as follows: The soft palate, uvula, tonsils, and generally the pharynx also, are more or less reddened and swollen, and the mucous membrane commonly looks rough and granular. The fauces are often filled with frothy mucus, or purulent secretion, which sometimes line the inflamed surface in such a way as to resemble false membrane. They are to be distinguished only by careful examination and removing a small portion on a pencil or sponge mop, in order to ascertain their real nature.

Attention has been called to a variety of angina (œdematous) characterized by serous infiltration of the sub-mucous tissue of the pharynx, the mucous membrane itself being pale and smooth and soft, and sticky to the touch. (Meigs & Pepper.) This is not so often met in children as in adults.

Symptomatology.—Simple pharyngitis of moderate severity begins with restlessness, irritability, fever, slight cough, and in some instances pain in the throat, which is complained of by older children, and betrayed in those who are very young, by the refusal to nurse or take food, because of the difficulty of swallowing, the face is generally flushed, sometimes very deeply so. Young children are often drowsy, but from irritability and fever refuse to sleep except on the lap. The fever is marked by acceleration of the pulse which rises to 100, 110, or more in children over five years of age, and to 120, 130 or 140 in those under that age, and by unusual warmth or even heat of the skin.

At the same time the respiration is more frequent than natural, but almost always regular: in some cases attended with high fever it has been counted at forty-two and fifty. Auscultation reveals pure vesicular murmur or slight sibilant rhonchus. The voice is clear, or in rather severe cases, obscured and nasal, and in some instances speaking is painful and difficult. Cough is a frequent symptom, sometimes, but infrequently harsh and croupal. The croupal sound seldom lasts over one night, after which the cough is merely hoarse and gradually becomes loose toward the termination of the attack. Pain is a frequent, but far from constant symptom at the outset of the disease, and generally exists during deglutition. When present it is shown in infants, as stated, by their refusing the breast, or nursing only at long intervals, and with difficulty; while in older children it is complained of. Throughout the acute period of the disease there is generally considerable thirst; the appetite is diminished or entirely suppressed; the stools are usually natural, or there is slight constipation.

The throat should always be examined when there is the least reason to suspect that an attack of sickness depends upon inflammation of that part, and whenever a child has been seized suddenly with fever, particularly in cold weather, and there is nothing more evident by which to explain the illness. To examine this part well, the tongue must be strongly depressed with the handle of a spoon, which should be carried back to the base of the tongue. This may be done in the youngest infant. If done rapidly the child will gag, throwing the whole pharynx into view. A glimpse should suffice. Some discount should be made for the full appearance of the throat as the gagging effort brings the walls forward. The submaxillary glands and neighboring cellular tissue are sometimes swollen in consequence of the extension of the inflammation to them; this is evident sometimes to the eye, and frequently to the touch. The amount of swelling is slight in very mild cases, or may be absent; in severer cases it is much more considerable.

The fever generally occurs at first only in the after part of the day and during the night, often becoming intense at times, with restlessness and starting, and subsiding or disappearing entirely towards morning to recur the next afternoon or evening. (*Bell.*) Children not unfrequently play about all the early part of the day, and are attacked with the symptoms just mentioned, as night comes on. In grave cases of simple angina, the disease begins with *vomiting, fever* and severe *nervous symptoms*, in the shape of excessive restlessness or somnolence, and occasionally convulsions. The fever is violent, the pulse being very frequent and full, and the skin hot and flushed. The intense heat and flushing of the skin, which in sanguine children sometimes affects the greater part of the surface of the body, together with the activity of the circulation, not unfrequently make the outset of the disease resemble very closely that of scarlet fever. Nervous symptoms, sometimes slight, occur in nearly all cases consisting of restlessness and irritability in mild attacks, and of insomnia or drowsiness, with starting or twitching, and even convulsions in those that are more severe. (Meigs & Pepper.)

Diagnosis.—It will sometimes be difficult to recognize inflammation of this part in young infants as the ordinary aspect of the state of congestion has a great resemblance to the redness of inflammation; yet the diagnosis may be assisted by the following considerations:

The isthmus of the fauces may be considered as inflamed.

1. When the duration of this redness continues beyond the ordinary time of the disappearance of the congestion in young infants, ten or twelve days for example. 2. When instead of being uniformly spread over every part of the throat, it occupies separate points. 3. When some one of the symptoms of cyanche tonsillaris exist at the same time as the redness, and when this redness is met with at a period when it is no longer a natural state of the part. (Billard).

As there are no local symptoms in two-thirds of the cases at the time of invasion, the physician and attendants are liable to be deceived as to the real cause of the violent fever which has so suddenly made its appearance, and may refer it to any but the true one. It has happened several times that pneumonia was suspected from the sudden occurrence of fever, rapid respiration, slight dry cough, and the absence of pain in the throat, difficulty of deglutition, or other symptoms, to call attention to the real seat of disease.

The diagnosis is to be corrected only by the absence of the physical signs of pneumonia. Angina may be mistaken for indigestion, (acute gastritis or gastric catarrh), which is one of the most frequent causes of sudden fever in childhood, and is accompanied, like severe angina by vomiting. Severe cases, particularly when ushered in by convulsions may be mistaken for disorder of the nervous system. It may also be mistaken for scarlet fever, and often for diphtheria. Here, however, we miss the muscular soreness and malaise so diagnostic of diphtheria.

Prognosis.—Simple pharyngitis of moderate severity is very rarely if ever, a fatal disease. Severe or grave erythematous pharyngitis, on the contrary is often a dangerous malady. The unfavorable symptoms in such cases are: Very violent fever, greatly altered physiognomy, difficult respiration, choked and gutteral voice, excessive jactitation, delirium, convulsions, and coma. (Meigs & Pepper). If the fever rises very high in plethoric subjects, convulsions usually occur.

Treatment.—The diagnosis of the remedy should be as carefully made as of the disease. In simple uncomplicated inflammation the leading remedies are: *Aconitum*, *Belladonna*, *Cantharis*, *Lachesis* and *Mercurius*. In addition to these remedies, *Ipecacuanha*, *Baryta carbonica*, *Causticum*, *Copaiva balsam*, *Hepar sulphur*, *Baptisia*, *Arum t.*, *Apis*, *Phytolacca*, and *Lycopodium* are sometimes called for in the treatment of pharyngitis. We give some of the indications:

Aconite, administered at a medium dilution (from six to twelve) in doses frequently repeated, very often arrests pharyngitis at its commencement, when it is accompanied by a febrile action, when the weather is dry and cold and the subject rather sanguine and nervous than lymphatic.

Apis is indicated where there is œdema of the fauces and uvula; throat swollen outside as well as in, rendering breathing and swallowing difficult. Older children complain of rawness and scalding all around the margin of the tongue.

Arum try. has rapid swelling of tongue, with prickling and burning pains. Refuses food and drink on account of the soreness of throat. Corners of mouth or nose sore, child digs the sores. Sleepless.

Baptisia cases have dark red fauces; dark putrid ulcers; tonsils and parotids swollen; unusual absence of pain; abundant viscid mucus which can neither be swallowed nor expectorated, in fact, can swallow only liquids, the least food gags; the throat feels constricted even down to the stomach.

Baryta carbonica from the twelfth to the fifteenth dilution is preferable to *Belladonna* in the case of lymphatico-nervous children disposed to chills, when there exists a considerable tumefaction of the tonsils, at the same time that these glands are rather rose-colored than of a vivid red with frequent expectoration of mucus, pressing and lancinating pain in swallowing. *Baryta* succeeds, especially when there is joined to the preceding symptoms incomplete stools, at first hard, afterward soft, small in quantity, without form, and light-colored, without being absolutely white. If a burning heat supervenes with stupor, somnolence, agitation, vomitings, diarrhœa, or constipation and convulsions, *Opium* will be found of the greatest utility.

Belladonna suits under circumstances nearly similar to *Aconite*, if there is great agitation and vivid redness and constriction of the throat. Its use will almost always be more efficacious if preceded by one or two doses of *Aconite*.

Cantharis.— Throat feels on fire, inflamed constriction, intense pain at the back part of throat, rendering swallowing very difficult, compare *Hepar s.*

Dulcamara frequently cures slight pharyngitis caused by moist cold, extending without particular swelling of the tonsils to the bronchia, and threatening to degenerate into bronchitis.

Ipecac.— If the swelling of the mucous membrane is such that the difficulty of breathing is very considerable; if suffocation is threatened with excretion of caseous, white, thick, and fetid matter in the throat; if in short there is imminent danger of gangrene, and even commencement of it, we must have recourse to *Ipecacuanha*.

Lachesis has: Throat sensative to touch; fauces purplish and swollen, so that liquids escape through the nose on attempting to swallow; can swallow solids better than liquids; child grasps its neck and left ear when swallowing, as from pain. The distress is out of proportion to the appearance of disease; worse after a nap.

Lycopodium corresponds to the hoarseness of nervous habitually constipated children. Commences in right side, goes to left.

Mercurius is frequently given in alternation with *Belladonna*. Child holds the head in the easiest position to facilitate frequent swallowing. Tongue large, flabby, and moist, so that a view of the pharynx is difficult. Throat swollen and very red; much saliva from increased size of glands. Case worse towards evening, which is true in many cases of children's diseases. If left side is worse, *Merc. iod.* has the preference; if the right, *Merc. bijod.* Child should sleep with head elevated.

Phytolacca is indicated by swelling of the soft palate and tonsils; sensation of scraping; rawness and choking in the throat, relieved by hawking.

Pulsatilla.—When pharyngitis more intense and not less extended is characterized by a vivid redness of the affected parts with obstruction of the nose, cephalalgia, burning fever without much thirst, voice hoarse or nasal, when above all there is sympathetic irritation of the stomach which is manifested by regurgitation or vomiting of aqueous or bilious matters, *Pulsatilla* is indicated.

Copaiva balsam, *Causticum*, *Hepar sulphur* and *Lycopodium* are to be tried in the treatment of chronic pharyngitis, especially the latter for children living on a limestone substratum. *Copaiva balsam* frequently succeeds, if the disease consists only in a slightly increased mucous secretion, with or without hoarseness. Teste has seen *Causticum* and *Hepar sulphur* administered by turns, bring back the tonsils to their natural volume, although in these cases he prefers to these medicines *Baryta carb.*

Compare remedies for Diphtheria, Croup, Tonsillitis, Mumps, etc.

DIPHTHERIA. PSEUDO-MEMBRANOUS PHARYNGITIS. ANGINA MALIGNA. A. GANGRENOSA. CYANCHE MALIGNA. ANGINA SUFFOCATIVA. GAROTILLO.

Diphtheria is an acute, specific disease, characterized by a special inflammation of the mucous membrane, chiefly of the pharynx and chief air passages, attended with enlargement of the lymphatic glands, rapid exudation either of fibrin or non-organizable lymph, and its deposit within and upon the surfaces affected. Other parts of the mucous membrane and the skin sometimes suffer at the same time, and changes often take place simultaneously in the spleen and kidneys, albuminuria frequently occurring at an early period. The disease is accompanied by great prostration of the vital powers, and is followed by a remarkable series of local lesions of innervation; the tendency to death is by asthenia, either coincident with the disease or gradually induced, or by apnœa, from implication of the air passages which may happen as early as the second day, or as late as the second week of the disease.

Diphtheria, the name by which that disease is commonly designated is a synonyme of the word diphtherite, originally applied to the disease by Bretonneau and signifies a skin or membrane.

Historical investigations show that the disease is by no means a new one, and that it was known in Egypt as early as the second half of the first century, A. D. There are also descriptions extant of an epidemic in Holland (fourth century), in Paris (sixteenth century), in Spain (seventeenth century), and in the present century has visited France, England and all parts of the United States.

A *primary* and a *secondary* diphtheria are distinguished, of which the latter associates itself particularly with measles and scarlet fever, and occurs in a sporadic form, whereas the primary almost unexceptionally prevails epidemically. (Vogel).

Etiology.—Nothing is as yet known with regard to the general conditions which favor its production; and it appears to have prevailed with equal severity in healthy and unhealthy situations; in damp marshy districts and in dry hilly regions; in the crowded filthy houses of great cities, and in sparsely populated villages; in the depth of winter and in the intense heat of summer. Nor can it yet be asserted (although it is probably true with regard to diphtheria as in the case of other zymotic diseases), that children of feeble constitution, and those subjected to bad hygienic conditions or debilitated by severe illness are particularly exposed to it, especially in the sporadic form. Sex appears to have no influence upon the frequency of diphtheria, but age exerts a very strong predisposing influence, as a large majority of all recorded cases occur between the ages of one and eight years. (M. & P.) The presence of a catarrhal affection of the mucous membrane, seems to predispose to diphtheritic infection; while the fact of having had and survived the disease does not grant for any considerable length of time that immunity against a second attack which is one of the marked characteristics of measles, small-pox and scarlatina. The most important question in etiology is that concerning the relation of certain vegetable organisms to diphtheria; whether their presence is determined by accident and by the existence of a soil favorable to their growth, such as is found in the products of the disease, or whether they stand in a causal relation to the diphtheritic process. The vegetable organisms which have been observed in the diphtheritic membranes of the fauces and air passages as well as in other products of the disease, belong to a group which comprises forms of such exceeding minuteness—for they stand on the very borders of the visible—that as yet we possess only the most unsatisfactory knowledge of their nature and organization.

These forms are classified under the heads of vibrio, bacterium and zoogloea. Of the vegetable organisms classified under the name of bacteria, there is one form in particular (the micrococcus) which penetrates the tissues whenever a diphtheritic disease occurs, but is accompanied by a second form (bacterium termo) in greater or less numbers. The vegetations in the pathological products of diphtheria consist principally of spherical bacteria (the micrococcus) accompanied by a larger or smaller number of bacterium-termo, represented always by the smallest form known, and this occurs so constantly that in every part where a diphtheritic infection has appeared, then the tissues and exudations are filled with these bacteria. In the secondary infection of wounds, tracheotomy, incisions and ulcers, the grayish skinlike false membranes, as well as the tissues themselves underlying them are crowded with these organisms. If the disease increases in intensity, a progressive increase of these organisms can always be demonstrated in the infected parts, and in the discharge from the fistula established by cutting in the trachea. In the beginning of the disease these organisms are already present in delicate, ring-shaped, grayish-white spots, scarcely rising above the level of the mucous membrane; indeed in the first hours of the disease consist solely of cells of the different epithelial layers and micrococcus growths, the former being penetrated and pushed out by the latter. Pus and fibrinous exudations do not appear on the surface of the mucous membrane until the disease has advanced further and then the amount depends on the severity of the attack.

It is believed by eminent observers that the bacteria spreads over the mucous membrane, beset the cellular elements, crowd especially into the young exudation cells, or are taken up by them and gradually cause their dissolution; they fill the blood and lymph vessels, and bring about in a mechanical way a damning up of the fluids, and as a consequence, serous exudation; as they close up the capillary vessels they occasion stagnation in the blood circulation, which induces disturbance of nutrition in the walls of the capillaries, and even rupture of the same. Muscular fibres also which are covered and filled with micrococci, degenerate and slough; in like manner in severe cases immense numbers of bacteria appear heaped up in the uriniferous tubules and malpighian corpuscles of the kidneys, and occasion there parenchymatous inflammation, capillary embolism of the glomeruli of the kidney, with ruptured vessels and formation of epithelial casts in the tubes.

In what way now bacteria acts as regards the pathogenesis of diphtheria, whether they consume the life of the blood and tissues, and incite simultaneous decomposition and new combinations of the molecules; whether all the products of assimilation remain shut up in the bacteria themselves, as do the insoluble pigments in pigment bacteria, or are thrown out again like the soluble coloring matters; or whether they form in the blood as does acetic acid in alcohol, and produce a toxic action like septecin, so that the special action of the fluid or organic in which the micrococci vegetate passes over into them; or whether finally, these organisms play the part of a fermen of oxidation or reduction—all these points are as yet undetermined. (Oertel).

Can this disease be communicated by inoculation? There are facts which tell for, and there are facts which tell against the affirmative answer to this question. M. Vulleix, a distinguished French surgeon when in attendance upon a little girl suffering from diphtheritic sore throat, received into his mouth, while inspecting her throat, a small quantity of saliva, driven out while in the act of coughing. The next day a small pellicle of exudation appeared on one of his tonsils. The other tonsil and the uvula became speedily covered with false membrane; a profuse discharge took place from the nostrils, the cervical glands and the areolar tissue around them were swollen, delirium supervened, and in forty-eight hours, without any laryngeal symptoms, he was dead. A medical friend of Trousseau's was performing tracheotomy for diphtheritic laryngitis; some blood got into the patient's trachea, and was sucked by the mouth of the operator who also died in forty-eight hours. Weber, Seehausen and Gillite fell sacrifices to their professional devotion. Bretonneau cites the case of Herpin, and in this country the instance of Dr. Adams, of Boston, as well as others who might be mentioned would certainly look like cases of inoculation. They certainly seem to show that direct contact of the poisonous matter may produce the disease, manifesting itself at once without any lengthened incubation and even proving rapidly fatal. (Watson). Successful attempts of direct inoculation have been made on rabbits by Trendelenburg, Oertel, Heuter, Tommasi, and Eberth.

On the other hand, Trousseau put the question of inoculation to the test on his own body. He punctured his left arm, his tonsils, and his velum palati, with a lancet moistened by contact with a false membrane which he had just removed from a diphtheritic sore, and a friend of his, Dr. Peter, once by accident, and twice by his own design became the subject of similar trials. No harm ensued in either case. The experiments of Dr. Harley upon animals, whom he tried to inoculate, also led to negative results. In weighing these facts it would seem difficult to suppose that greater power of propagation attacks itself to the fibrinous exudation, or special product of the disease than to some of the secretions and exhalations from the sick. Many of the profession can speak of having come into disagreeable contact with the secretion from the throats of sufferers, no bad effects following; very many can refer to dangerous illness in themselves as the result of too long or too close attendance in the sick room. It is probably to this influence rather than to direct inoculation that is to be attributed the death of the individuals above named. As to its contagiousness, the presence of one sick person in a house is sufficient for its communication to the susceptible, however carefully kept apart, so that the infectious matter must to some extent, be diffusible in the air, and the danger of infection would thus seem to be greater from this source than from direct contagion.

Nature.—Diphtheria is to be considered as a constitutional disease, the chief arguments in favor of this view being the continued febrile action of æsthenic type which attends its course; the marked alteration of the blood mass in color which is brown instead of red, and is of a different consistence; the tendency to pseudo-membranous exudation on other mucous membranes than the pharynx, larynx, and nasal cavities (vagina, conjunctiva, rectum, anus), or abrasions of the skin wounds either accidental or in tracheotomy; the occurrence of albuminuria, and this without any of those peculiar conditions of the kidney which bespeak the presence of Bright's disease, and finally the development of paralytic sequelæ, showing the presence of some morbid agent acting especially upon the nervous system.

Diphtheritic exudation is according to the old view a common fibrinous exudation, which is not deposited or only in part, upon the free surface of the inflamed part, but altogether or in great part within its tissue, and on this account is followed by a compression of the vessels and gangrenous death of the tissue. According to Virchow, there is no exudation, but the tissue elements, especially the cells, are found to be quickly filled with a cloudy substance and to be destroyed by a fatty metamorphosis; according to this the principal thing is necrobiosis. According to Buhl, diphtheritic exudation has its origin in a "fibrin-like connective tissue growth" of such high grade upon free surfaces as well as in parenchymata, that compression of the new-formed and old vessels, anæmia, and finally destruction of the new-formed and old tissue result.

In late years the occurrence of fungi in diphtheritic exudations has been almost constantly observed. The kind of fungous even is not yet well established. Besides there still arise differences of opinion concerning whether the fungus is only accidentally present, or whether it is the essential cause of the local and general disease not infrequently connected with it; the former appears to be the case from investigations upon man, the latter from experiments upon animals. In man, fungi (micrococcus, vibrio, leptothrix) occur constantly in the uppermost layers of laminated epithelium. They are found mostly as masses of globular bacteria, regularly also in the uppermost layers of not quite fresh croupous and diphtheritic. According to Buhl a fungus constantly occurs in diphtheria, which grows through the epithelial layer of the mucous membrane, but he is undecided whether the fungus is peculiar and necessary to diphtheria, or whether it is accidental — the leptothrix buccalis. This author holds diphtheria to be a general infectious disease, entirely independent of any previously-existing local affection, and that the disease in the air passages is not an originally localized affection, but an indication of a general infection, manifesting itself by preference upon the tonsils, in the larynx, etc., as scarlet fever upon the skin, mumps in the parotids, etc. Grauvogl considers the membranes to consist chiefly of cells of ferment and microscopic fungi — (diplosporium fuscum) — which grow between the cells, rooting deeper into the mucous membrane, compressing its vessels and causing mortification of its structure.

Pathology.—The local lesion peculiar to diphtheria is most readily induced in surfaces exposed to the free access of air, and though not restricted to them it is there that it assumes its most characteristic development, there is a stasis of blood in the capillaries, a destruction of the red corpuscles and a formation of fibrin as shown by the spontaneous coagulation of part of the exudation. These changes take place in close contact with the blood vessels and commence in the mucous membrane beneath the epithelium, transforming the cells of the sub-epithelial layer or of the epithelium itself, or altogether replacing them by the fibrinous exudation or false membrane. (Squire). When fully developed, the pseudo-membranous deposit has the ordinary appearances of a fibro-plastic membrane; but this stage is preceded by the exudation of a sero-mucous, transparent, and viscid fluid, which varies in abundance in different cases, at times even forming a sort of submucous exudation, sufficient to raise the epithelium in the form of phlyctenæ. This liquid does not long remain transparent and diffluent, but soon becomes a little less transparent in points, gains a yellowish tint, acquires a greater density, and adheres strongly to the subjacent mucous membrane. These points at first isolated and circumscribed, soon coalesce so as to form a delicate pellicle but slightly cohering, and capable of being raised from the mucous membrane by slight traction, although owing to its friability, it is difficult to raise a piece of any considerably size. This pellicle is more dense and thick at its centre than towards the edges, and soon after its formation the exudation continuing beneath it and coalescing with it, it gains in thickness by the apposition of an under layer, until when the membrane is fully developed it may consist of several layers, and appear imbricated. At this period its adhesions are so strong that, if it be detached from its connections, slight hæmorrhage will follow, or numerous bloody points may be seen upon the subjacent mucous membrane. The appearance of the opaque spots in the sero-mucous fluid is believed by Empis to be due to the precipitation of fibrin independently of any agency of living tissue. Thus the tubular casts which form in the air passages are rarely adherent, and are usually much smaller than the cavity occupied; and in cases of tracheotomy he has noticed the canula to become lined in a few hours with a layer of whitish concretion, the thickness of which continually increased, and which was evidently only the result of coagulation of the liquid by which the sides of the canula were constantly covered. (M. & P.) Superficial ulceration results from the interstitial necrosis of some parts of the tissue invaded by it, but there is no gangrene or mortification of its substance. Changes of decomposition rapidly takes place in the deposit itself, with injurious consequences, both to the lymphatic glands near, and to the system at large from the absorption of effete matters; the site of these changes may occasion other ill-effects, by contaminating the air of respiration on its passage to the lungs. The disappearance of the false membrane is effected partly by this superficial destruction and partly by absorption from its under surface and edges, and by return to healthy action in the vessels below. It is seldom entirely separated in this way; a thin layer is often left through which pink points gradually appear; soon only isolated spots of exudation remain, which are finally removed by absorption, gradually effected as the process of reparation proceeds.

Albuminous urine is next in importance. The albuminuria is not to be considered as solely dependent on an original change in the blood, but chiefly upon a morbid process in the kidney which is one of the disseminated lesions of structure occasioned by the general disease. Congestion of the Malpighian tufts is an early lesion, followed by further change in the tubular structure of the kidney; a relation is found between these changes and the amount of albumen, but no constant relation between the albumen and the amount of blood change. (Squire). Tube casts may occasionally be present in the albuminous urine, bnt are of infrequent occurrence. Dr. Helmuth says: "Casts of the tubuli uriniferi have been seen in the urine; but I have often known great albuminous deposit to be present, and not uriniferous casts," and Dr. Condie remarks that albuminous urine, even when most marked and profuse would occasionally be found entirely free from tubal casts. It is claimed by Bouchut that cases occur in which the renal disorder goes on to those anatomical changes known as Bright's disease. In all attacks of malignant diphtheria, hæmorrhages are apt to occur, and are not unfrequently intractible and quite uncontrollable. Of the different varieties, that from the nose is the more frequent. The reason is apparent. The capillary vessels are either left gaping open by the corrosive action of the pituitary mucus, or the blood is so thinned as to transude with the greatest facility. A passive flow may take place from the throat and fauces, from the separation of the exudation, leaving a denuded and vascular surface quite free to bleed, until a fresh supply of plasma has organized to cover it again. Any one of the free surfaces named as liable to become the seat of the diphtheritic deposit may suffer from a more or less troublesome hæmorrhage. (Ludlam).

Symptomatology.—Some general constitutional symptoms precede those occasioned by the concomitant local changes; both may co-exist in every degree of severity, sometimes one, sometimes the other attaining a deceptive prominence; at other times both are so obscure as to make the inroad of the disease remarkably insidious. Among the earlier symptoms are yawning or sighing, shallow or infrequent respiration, great lassitude and debility, some aching of the back and legs, either a distinct vigor or chilliness, pallor, a sense of nausea or rising in the throat, anorexia, sometimes vomiting or diarrhœa, and in young children convulsions, a sense of constriction across the forehead, or intense headache, vertigo, extreme muscular weakness, some anomalous fixed pain, an altered mental state, an indifference of manner, and an obtuseness of the mental faculties; this latter gives place to a short period of excitement, during which it may be thought that no illness is impending. There is, however, a marked elevation of temperature, which is increased at night, when wakefulness or restlessness always occurs. The pulse is accelerated, rising in children and young persons to 130, or even to 140 in a minute; this frequency soon subsides, generally before the end of the second day; and though the pulse continues to be quick, it is either feeble or easily compressible. The elevation of temperature is always marked and characteristic; it may be as high as 103° very early in the disease; it will generally reach this point by the end of the third day, and is highest at night, when it may amount to 104°, then probably with delirium. The respiration is never proportionately accelerated at this period. The tongue is moist, with a thin creamy fur; the urine is pale in color, at first free, soon rather less in quantity, with scanty deposit of lithates, but still pale, and at this time it may be albuminous. The lymphatic glands at the angle of the jaw are already perceptible; there is always some enlargement of the cervical glands, and redness with a little swelling of the posterior part of the soft palate, of the fauces of the back of the pharynx and of the tonsils. The throat is sore, deglutition is difficult, if not painful, sometimes the pain is felt in the ear, and there is frequently stiffness of the neck; very little external swelling is at this time noticeable, and there is no diffused redness of the skin; sometimes little red spots are found on different parts of the surface, as over the neck or behind the ears; there may be suffusion of the eyes and slight injection of the conjunctival vessels, and a little obstruction to the nasal passages from a similar vascular state of its lining membrane. Sometimes this is seen at the nares to be simply red, sometimes an opaque white spot may be noticed beneath the epithelium, or one nostril may be completely obstructed, and some fibrinous exudation already noticeable; sometimes the back of the pharynx will show the first indication of this in lines of opaque tenacious secretion, or commencing deposit is seen there in the apices of its enlarged follicles. The earliest evidence of the disease is, however, most frequently found within the follicles of the tonsils or deposited on its inflamed and turgid surface.

The first general symptoms are transient and may be so trifling in degree as to escape notice, until they are intensified by the progress of the local lesion; this will give rise to pain, heat and soreness of the throat with impeded function; it also excites some sympathetic febrile disturbance of its own, and always increases that proper to the general disease; where both are severe, the throat though covered with exudation is often the least part of the patient's complaint; where both are slight there may be an interval in which little complaint is made. During this interval (two days) there may be no visible exudation in the fauces; the tonsils continue to be enlarged and their surface irregular, and they in common with the whole of the pharynx, the arches of the palate, the velum and the uvula are of a deep-red color and unequally turgid; one side is usually the most affected, the uvula is enlarged, red and glistening, and a mottled redness extends forwards from it over the soft palate, but the rest of the buccal membrane is pale. Some of these parts soon appear more tumid and glistening than others, and spots at first semi-transparent, and afterwards opaque, rapidly form and coalesce, so that in a few hours a large surface may be covered with a continuous layer of exudation; or the exudation is limited to one or more centres, the mucous membrane around being elevated and of a violet tinge of redness, until it is invaded by the same change. The raised edge is then extended, the centre being occupied by a flattened, yellowish-white, leather-like deposit increasing in thickness by additions to its under surface; this is accompanied by the pouring out of a considerable amount of a more fluid secretion, while that from the surrounding mucous follicles is also increased and altered in quality, so that a tenacious fibrinous matter is mingled with the mucus. The cervical glands increase in volume, the sub-maxillary lymphatic glands especially; a large amount of serous infiltration takes place in the surrounding cellular tissue, and the whole of the front of the neck becomes greatly swollen; deglutition is involuntarily suspended, secretions escape in some quantity from the mouth, and even from the nostrils, by which the lips are excoriated. The superficial layers of the localized deposit, partially separated and exposed to the passage and re-passage of the air, and the warmth and moisture of the mouth, undergo decomposition and give rise to great fetor; extravasated blood mingles with the decomposing exudation, or escapes freely from its under surface, or occasions epistaxis. The voice is muffled or nasal in tone; impeded respiration may occur from the physical obstacles in the fauces without laryngeal symptoms arising; or these being slightly marked, symptoms of pulmonary obstruction come on insidiously. These processes may be gone through with great rapidity, and are accompanied by the most marked adynamia; the pain in the head is intense, the restlessness and agitation is extreme, vomiting of diarrhœa may occur, the lips and tongue become dry and brown, the pulse very rapid, feeble and irregular; the skin becomes cold, the face pallid, the whole attitude is indicative of powerless exhaustion; there is impaired consciousness, slight delirium, or deep somnolency. and some repeated attack of syncope terminates life.

Extension of the disease to the larynx and trachea may be the cause of death at a much earlier period; the air passages are especially liable to become the seat of the peculiar exudation of diphtheria; it may commence there either by independent centres of deposit, or by the spread of exudation from the pharynx to the epiglottis, over the aryteno-epiglottidean fold, and thence downwards even to the remotest bronchi, and be fatal, with symptoms of sudden or slow suffocation, in the earliest stages of the disease, or at the period of greatest exudation, towards the end of the first or commencement of the second week. This extension often proceeds insidiously when the general symptoms are of great intensity, and is only indicated by hoarseness or weakness of the voice, and by some laryngeal quality in the breath sounds, faintly audible during both inspiration and expiration, by signs of impeded respiration, evinced in the œdema of the face and livid hue of the lips, sometimes only by pallor, and gradually deepening unconsciousness, and by the retraction of the softer parts of the thoracic parietes. In other cases the first invasion of the mucous membrane of the upper part of the air tube is announced by highly characteristic phenomena similar to those produced by acute laryngitis in adults, or by idiopathic croup in children, differing only in the less sharp and sonorous clang of the cough, in the more husky tone of the voice, and in the antecedent and concomitant symptoms. Besides the appearance in the fauces, and the dysphagia, the sudden change from the asthenic character of the prevalent symptoms to the excitement, arterial and general, now occasioned is very striking. In other cases among children the disease may have set in with no great severity, the power of swallowing and even the desire for food may be returning, and the child no longer confined to bed, is resuming its amusements, when a hoarseness of voice and a noise in breathing are the only precursors of paroxysmal dyspnœa, differing only from that of croup in the time of day in which the first attack may occur, and in the readiness with which the child will return to play on its subsidence, but soon becoming more terrible in the unintermitting violence which it rapidly assumes, or in the suddenness of the fatal result. Paroxysm of severe dyspnœa occur, from superadded spasm no doubt; the lips and face become pale or livid, and death by suffocation closes the scene. Strips of the false membrane are sometimes detached and brought up by the cough, with temporary, or possibly with permanent relief; but the membrane is too apt to be renewed, and it may be renewed with great rapidity. Albumen is found in the urine in the great majority of cases; its presence either in large or small quantity does not necessarily affect the excretion of urea; this is always increased during the whole period of illness, and when the disease is at its height is frequently double. It is not persistent after recovery, and does not often result in anasarca. Hæmorrhage is not infrequent, and may be so profuse as to cause sudden exhaustion, either on the separation of some morbid deposit of unusual depth, or from some dyscrasia of the blood favoring its ready transudation. Vomiting and diarrhœa generally absent after the first ingress of the disease, may set in with gastralgia and great depression. Exhaustion may come on gradually without these symptoms, the pulse increases in rapidity and feebleness, and death takes place without distress of breathing or impairment of the mental faculties. In some of these cases fibrinous coagula form before death in the cavities of the heart.

The liability of other mucous membranes and of the skin, especially when denuded to become the seat of changes characteristic of diphtheria, has often a great influence on the progress of the disease; eczema behind the ears, or in any fold of integument, abrasions or fissures at the juncture of the skin and mucous membrane may become affected, and add greatly to the amount of disease against which the patient has to contend; a cutaneous eruption, occasioned by the disease itself, is sometimes, though rarely, the seat of these ulterior changes; the cuticle is raised, a white surface is exposed, the skin immediately around is red and tumid, new vesicles, sometimes sanious are raised upon it, they burst and coalesce; the white layer extends its surface, which is still somewhat below the level of the surrounding skin; it increases in thickness by additions from below, and the upper layers soften; decay and disintegrate; it is accompanied by an irritant fluid secretion. Not only will every abraded or irritated surface take on this action, but isolated patches of deposit may occur on the edge of the lip, in the meatus auditorius and upon the conjunctiva. In the latter situation the lids are greatly swollen, there is profuse lachrymation of hot acrid tears mixed with yellowish flakes of fibrinous material; the infiltration is marked throughout the entire conjunctival surface, accompanied by chemosis. Open wounds undergo a similar change, the superficial granulations are converted into this pseudo-membranous layer, cicatrization stops, the wound becomes painful, and a copious ichorous secretion is poured out; a fissured nipple has been the starting point of the morbid process, and much of the surface of the breast has suffered; the disease readily establishes itself in the vagina, where layer upon layer of false membrane may accumulate. An abraded surface of integument is sometimes covered with a granular or pulpy exudation only, attended with but little fluid secretion; the affected surfaces then continue to be irritable, but do not always extend. (Squires).

During the first days, or later on in the disease, the diphtheritic process may advance from the throat upwards into the naso-pharyngeal space, may proceed from the uvula and from the borders of the palatine arches, passing from the anterior to the posterior surfaces. More rarely, extensive exudations start from the posterior wall of the pharynx and spread continuously upwards towards the base of the skull, and the superior wall of the naso-pharyngeal space, from which point they pass onwards towards the vault of the posterior nares, and the superior attachment of the septum.

At first the patients complain of a sense of pressure and stopping up of the nasal passages which interferes with their breathing, and they endeavor to rid themselves of the annoying sensation by making various efforts to blow through the nose, by which means they succeed in expelling muco-purulent masses of greater or less size. These symptoms are rapidly followed by the additional ones of an acute catarrh.

An abundant discharge comes on, which at times is of a muco-purulent character, at times thin, watery, and discolored. Later, though often but a short time after; when rapid decomposition of the accumulated deposit has taken place, the discharge is converted into a foul smelling product of brownish color and mixed with blood. The skin about the nostrils, as well as on the upper lip is reddened and excoriated by the flow of the acrid secretion. Such excoriated surfaces are generally soon transformed into ulcers, the surface of which is covered with a grayish white diphtheritic coating. Epistaxis accurs repeatedly in the very beginning, but more frequently in a more advanced stage of the nasal affection; it may take on a threatening character when signs of septicæmia have already manifested themselves and large ulcerations have formed in the nose. Under certain conditions the hæmorrhage may directly occasion death. If the diphtheritic process extends to the lower nasal fossa and the nasal portion of the lachrymal duct, the latter may become impassible and epiphora may ensue, caused by the swelling of the mucous membrane, or by the obstructing false membranes; through this duct also the process may reach the submucous tissue of the eye and cause conjunctival diphtheria. When the disease attacks the mouths of the Eustachian tubes, the patient complains of a ringing, buzzing or roaring noise in the ears, and piercing pain there, which is much increased by swallowing — in other words, of symptoms similar to those of simple inflammation of the middle ear. In testing the acuteness of hearing, a marked loss will be demonstrated. If the disease passes through the Eustachian tube into the middle ear, and reaches the inner surface of the tympanum — which latter with the ossicles, will be covered with false membrane,— in the most favorable cases, after the membrane has been thrown off the drum head will be perforated and a puriform fluid will flow from the external ear. In the severest cases a moderate reddening of the nose is observed externally or an œdematous swelling, with a remarkable pallor and peculiar glistening appearance of the skin. Swelling of the cervical glands, and those situated more deeply, is not present so long as the disease has not attacked the parts from which their vasa efferentia take their rise. The course of the disease is in most cases comparatively brief terminating in a few days. When the process without having attained a considerable extent, is disposed to heal, the false membranes gradually loosen; the unpleasant odor from the nose, and the discharge mixed with ichorous fluid, disappear; an excretion of a more muco-purulent character sets in and may last for several days, and finally complete recovery take place. When, however, as is almost always the case, the affection, independently of disease of the larynx and throat, leads to a fatal termination, the local signs grow rapidly worse. The exudation loosened to a great extent, decompose and are transformed into a thick, stinking, ichorous fluid, which erodes the underlying mucous membrane, and may lead to ulceration of the same and even to disease and destruction of cartilages and bones.

A remarkable train of symptoms often make their appearance after the diphtheritic affection ; these are the occurrence of partial or complete muscular paralyses, not only in the muscles of the pharynx and larynx, the mucous membranes of which were covered with a diphtheritic coat, but also in all the other portions of the muscular system. Then again, on the other hand, the velum and pharynx may be attacked by secondary paralysis in cases in which these organs were not primarily affected, as for instance where the infection has taken place in other parts of the body, through wounds or incisions. (Oertel).

Loss of power and of sensibility in the parts supplied by the par-vagus occur at a somewhat earlier period than the paralytic affections of other parts of the body, and hence arise special sources of danger ; the slow, weak pulse observed in the second or third week of illness is from this cause and is frequently a fatal symptom. The pulse may be reduced in children to sixty or even forty beats in the minute, and the child seeming otherwise well, death by syncope has occurred suddenly, on some undue exertion ; or the heart's pulsations have gradually failed to thirty, or shortly before death, even to sixteen beats in the minute. (Squire).

Usually the paralyses are developed only gradually and slowly, and its more characteristic symptoms are seldom discovered immediately after the termination of the local affection, but as a rule appear first during the second or third week after the complete healing of the lesions of the mouth or nose. The first recognizable symptoms are furthermore concealed by the fact that a muscle is seldom suddenly paralyzed ; it is only gradually that more and more of its fasciculi become incapacitated, so that the muscle remains for some time longer, partly under the control of the will. After the paralysis has begun it may either confine itself to a limited region or implicate more extended portions, and can even in exceptional cases spread to all the muscles. The course ordinarily taken by this process is characteristic. Paralysis of the soft palate and pharynx is first noticed ; this is followed either immediately after a short interval by disturbances of vision, while paralyses of the lower and upper extremities occur later. Paralysis of the muscles of the soft palate and of the pharynx is the most common of the paralyses ; the soft palate and the uvula hang loosely down and cannot be raised to give the open sound of the vowel *a* as in health ; speech is nasal, thin, like that of individuals with defective palates, and is rendered completely unintelligible when there is any noise in the vicinity and the patient is tired.

The patients are not able to pronounce the single letters distinctly the sounds run into one another, and the palatals are particularly indistinct because the necessary approximation of the soft palate and the root of the tongue is no longer possible on account of the arrested action of the tensor and palato-glossal muscles. In many cases difficulty of deglutition first calls attention to the beginning or already existing palatal paralysis. In the attempt to swallow, the patient notices that this function is not so easily performed as formerly. When taking liquid food or while drinking, especially when the head is bent slightly forward, either a portion of the liquid runs out of the nostrils, or is all regurgitated, or, if some of it has fallen into the larynx, it is forcibly ejected, partly through the nose with violent coughing. The patient can as a rule swallow solid food more easily; but still it happens often enough that only a part gets into the œsophagus, the rest going into the naso-pharyngeal cavity, thence into the nose, from which it is removed by blowing. As a further consequence of palatal paralysis, difficulty of expectoration is to be noticed. In such cases the mucus collects in larger quantities, and cannot be so easily thrown out, because the muscles which act as constrictors of the pharynx are paralyzed, and consequently the compression of the expired air which is necessary to expectoration is lacking.

Disturbances of vision occur either shortly after, or in rare cases, at the same time with the appearance of the palatal paralysis. Generally the patients first complain that they can no longer read fine print, that when the effort is made they have flashes of light before their eyes and see indistinctly, and their eyes at once feel fatigued. Double vision with squinting often occurs; also vertigo, which is due to defective muscular sensibility. These symptoms are caused by a commencing paresis of accommodation almost always in both eyes, due to paralysis of the internal muscles of the eye, which are supplied by the short root of the ciliary ganglion, whilst in other cases the aculo-motor and the abducens are included. (Ziemssen). The olfactory sense is much impaired, and indeed, quite suspended in many examples. The auditory filaments may be functionally disordered; the hearing is thickened, or there may be real deafness, a result which is sometimes due to an extension of the inflammation from the pharyngeal cavity, along the Eustachian tube to the middle ear again to the tumefaction of the tonsils and cervical glands, and at others to paralysis of the delicate filaments of the portio mollis. (Ludlam).

Of the paralyses of the extremities, the lower extremities are most often the seat of the paresis, but it may begin in these and pass to the upper members. In the first case the affection begins with a sensation of cold and numbness (a furry sensation), or with sharp pains in the feet followed by trembling of the extremities and paretic weakness, and the patient feels feeble, awkward and uncertain in his gait. If this incomplete paresis goes on to complete paraplegia, the patient becomes unable to hold himself upright upon his feet, or to move them voluntarily.

In the second case the patient first notices a sensation of numbness and formication running up from the fingers; his arms become powerless, his hands awkward and incapable of co-ordinated movements, so that he is no longer able to dress and undress himself, or to hold large objects, until finally the paralysis becomes complete, and the attitude of the arms is determined by their own weight. The muscles of the paralyzed extremities are flaccid and without tone, and not infrequently become atrophied. There is also a reduction of the tactile sense.

The muscles of the larynx are seldom paralyzed alone, or in immediate connection with pharyngeal paralysis, but in the majority of cases are attacked only when the paralysis is more general.

The muscles of the neck and trunk, with the diaphragm, are generally the last to be attacked by the constantly progressing paralysis. Patients suffering from paralysis of the muscles of the neck and nape are with difficulty able to balance their head upon the vertebral column, and when it falls forward or backward, they are not able to lift it up again without help. If the muscles of the trunk are considerably affected it becomes impossible for the patient to raise himself from the horizontal position, or to turn himself in bed from one side to the other; when placed in a sitting posture he sinks together. Since the expansion of the chest during inspiration is steadily rendered more incomplete by the paresis of the muscles of the thorax and abdomen, symptoms of disturbance of respiration shortly appear —slow superficial breathing and occasional asthmatic accidents becoming constantly more prominent, until with paralysis of the diaphragm excessive shortness of breath, cyanosis and asphyxia are developed, and death is caused by œdema of the lungs. Should the paresis remain incomplete and the diaphragm retain some power to act, even the most serious accidents of this kind may pass over and the patients recover.

Paralysis of the sphincters of the bladder and rectum is observed in some cases simultaneously with, or shortly after the appearance of paralysis of the lower extremities. Ordinarily it appears first during the development of general paralysis.

In diphtheria there is great danger that the products of an extensive disorganization of the tissues may pass into the circulation, and that a poisonous action, similar to that caused by products of putrefaction in general, may manifest itself. (Billroth). It is only in rare cases that the toxic symptoms appear prominently on the first or second day, leading in a short time to the fatal result, as a rule however they develop gradually after the disease has already existed for some time. Shortly after the exudation has appeared in greater or less amount or perhaps not until the false membrane has been present for some time, without having increased appreciably in size, it is noticed that the breath from the mouth of the patient becomes more and more foul smelling and fetid; the false membranes assume a dirty gray, brownish appearance, lose their properties of resistance and toughness, become soft, brittle and break down at many points into a grayish-brown, semi-solid, greasy layer, which shows the greatest virulence when inoculated upon animals. The fluids from the mouth combined with the ichorous products from the decomposing and liquefying membranes, assume the character of a stinking, corroding ichor, which in flowing from the mouth causes reddening and excoriation at the corners, and small fissures or denuded parts are quickly changed into extensive ulcers covered with a dirty-grayish coating. In spite of these extraordinary processes, on removing the decomposing covering, the substance of the sub-epithelial tissue is found smooth and intact. The septic symptoms, when once they have appeared, last as a rule but a short time. In severe early infection, especially where the epidemic is of a malignant type, the earliest symptoms afford clear signs of blood poisoning, and by the time the first false membrane has formed, the whole organism is profoundly affected; death in these cases, frequently follows in forty-eight hours; as a rule, however, it occurs on the third or fourth day. In other cases, when the development of the diphtheritic process is slower, and the blood poisoning from the diseased mucous membrane takes place in a gradual manner, the disease is prolonged, and ends fatally between the tenth and fourteenth days; the first signs of toxic action on the blood having appeared four or five days previously. The disease rarely lasts longer than two weeks. The fatal result follows in consequence of blood poisoning, exhaustion and inanition, without the development of any more marked indications of general intoxication.

Like the course and duration of the septic symptoms, so the final symptoms and the causes inducing the fatal results are varied. When the course is rapid, the symptoms already described become violent. The phases follow each other in quick succession; the false membranes form on the livid, œdematous mucous membrane, and soon undergo ichorous disorganization; the discharges from the mouth and nose become stinking and corroding; the cervical and submaxillary glands become enormously swollen, and there is œdema of the surrounding cellular tissue, enlarged to such a degree that the neck and face pass into one another without apparent boundary lines while the tense skin appears smooth and shining, and the swollen parts feel at times doughy, and at times hard as a board. The face of the patient becomes bloated, pale, wax-like; the pulse small, weak, irregular and remarkably slow; the temperature is slightly raised, or may fall below the normal, the strength is gone, but consciousness remains unclouded even in the last hours (delirium being only exceptional,) and death ensues from œdema of the lungs or some affection of the heart.

When the disease takes a less violent course, and exudation and disorganization follow less rapidly, the symptoms of septicæmia develop slowly, but progressively. The patients make no special complaint, they lie quietly on the bed; the face becomes pale and sodden; the exhaustion and loss of strength increase; the appetite fails or the patient vomits the food taken; at the same time the temperature falls below the normal, to between 96° and 97° F., and a cold, sticky sweat covers the forehead and extremities. The pulse scarcely reaching forty or fifty beats in the minute, is irregular and intermittent, and death follows suddenly, as a rule during some slight motion of the patient, after some excitement of short duration, or during a state of unusual quiet.

If diphtheria of the fauces and other air passages passes into gangrene, the local and general signs of the process are alone prominent. When unmistakable signs of gangrenous disorganization appear on the mucous membrane, the inflammatory and febrile signs commonly give place very quickly to those of depression and collapse. The features of the face lose their character, the pulse grows frequent and small, the skin cool. Often there are marked chills, metastatic inflammation of internal organs through septicæmia or embolus, erysipelas of the skin, nervous symptoms, meteorism and involuntary stools, death finally closing the scene. Only rarely does the process go on to separation of necrosed portions like the uvula, arches of the palate, etc., with corresponding deformities after the healing process is completed. (Oertel). Intestinal catarrh during and after diphtheria, in small children who are laboring under dentition difficulties, is often of very protracted duration, and conjointly with the increasing anæmia, frequently leads to death. (Vogel).

Diagnosis.—A careful inspection of the fauces will, in the majority of cases, be conclusive as to the presence of the disease; where a yellowish patch of exudation moulded to the surface it has invaded, is thus brought into view, the nature of the serious illness which may have been obscure, is at once revealed; where this anatomical character of diphtheria is not obvious, the appearances in the fauces taken in conjunction with the associated phenomena will still be of primary diagnostic value. The earliest stages should be distinguished from catarrhal affections. The redness of the fauces in diphtheria is more intense, but less uniformly diffused than in catarrhal inflammation; the tonsils are more tumid and one side is more affected than the other, the lymphatic glands at the angle of the jaw and beneath the sterno-mastoid are always enlarged. Tonsilitis resembles diphtheria in the two sides of the throat being unequally affected and in the occurrence of external swelling at the angle of the jaw; the constitutional symptoms are, however, symptomatic, dependent on, and in proportion to the local complaint; the lymphatic glands are not enlarged at the commencement of the attack, nor those beneath the sterno-mastoid at any time. A yellowish, soft secretion appears at the orifices of the tonsil; the mucous surface preserves a smooth, glistening appearance, and any exudation of lymph upon it is semitransparent, very thin, and limited in extent. In examining the fauces in the early stage of the affection, it is well to remember that in simple angina, the crypts of the tonsils occasionally become so distended by their secretion, as to present the appearance of small, round and slightly elevated whitish patches, which might readily impose upon a hasty observer for pseudo-membranous deposits. (M. & P.)

In scarlet fever the throat affection is always preceded by symptoms of severe febrile disturbance, which are persistent, and in proportion not to the throat affection, but to the severity of the attack of fever which follows. The diminished frequency and fullness of respiration at the outset of diphtheria is often an indication of value when the disease is not yet fully developed. The cervical lymphatic glands are enlarged in both diseases. The redness of the throat in scarlet fever is uniformly diffused; on the second day it becomes very intense, appearing simultaneously upon all parts of the throat and palate, and affecting the papillæ of the tongue; both tonsils are equally enlarged. In diphtheria the redness and turgesence are greatest in certain parts about to become the seat of exudation and at the edges of the exudation already formed, so that it and the surrounding redness gradually advance upon the contiguous portions of the mucous membrane; the papillæ are neither red or enlarged, and the tonsils are unequally affected. In scarlet fever exudation both tonsils are covered with a milk-white layer applied equally to the surfaces of both, and the soft palate and tongue may be covered with a similar layer, and at a certain period is detached in shreds; it is not capable of absorption, and on its separation leaves a red and sensitive surface. In diphtheria the process of exudation continues to be active for some time; on its cessation there is a separation of membranous layers of considerable density and extent, which may represent a cast of the surface on which they formed; a reabsorption is now possible of some of the products still imbeded in the mucous tissue; this is accomplished without loss of substance or with superficial ulceration only. Although in some epidemics of diphtheria, a rash is said to have been occasionally noticed, its occurrence is at most the rare exception instead of the almost invariable rule, as in scarlatina; it differs too from that of scarlet fever in appearing suddenly in patches, not deepening in intensity, and in being of a uniform erythematous redness without the punctated appearance peculiar to the scarlatinous eruption.

Albuminuria as a sequel to scarlet fever, interferes with the excreting power of the kidneys, is attended with hæmaturia, and more frequently results in dropsy and anasarca; it is an early symptom in diphtheria, is rarely attended with hæmaturia, seldom interferes with the excretion of urea, and does not result in dropsy.

One of the most positive proofs of the essential difference of these affections is the fact that they have no protective power whatever, against each other, and that while second attacks of scarlet fever are rare, they seem to be much more common in diphtheria.

Prognosis.— No case of diphtheria is to be regarded without anxiety; every danger to the disease may result, though the early symptoms are but slightly marked. The successive appearance of fresh patches of deposit, of albuminuria, or of other signs of the disease excites alarm lest its next local manifestation should be in the larynx; the simultaneous occurrence of many of these signs and the increase of any of them, as of the enlargement of the lymphatic glands, and of the amount of exudation indicate an intensity of the general disease which the young or feeble can hardly withstand, and which with implication of the larynx, will be rapidly fatal. The least laryngeal quality of the voice or cough, and especially of the respiration, is a sign of the greatest danger; it may in the strongest person, soon end in fatal obstruction of the glottis, from the occurrence of exudation there, or it may be the first indication of the equally fatal and more insidious extension of it to the bronchi. Much exudation in the nasal passages is unfavorable. The occurrence of hæmorrhages is a bad and dangerous symptom; so is repeated vomiting and purging at the commencement of the attack. A very rapid pulse, except at the commencement is indicative of danger, so also if the pulse fall below the normal frequency. Any increase of the temperature of the body after the first five days, or a persistence of high temperature after the first ten days is unfavorable; a sudden rise may indicate danger from some intercurrent disease. The characteristic prostration of diphtheria may become a sequel to it. Convalescence from this disease is always lingering. The patient's system does not react, his vital energies run low, and there is constant danger of asthenic relapses to which he may finally succumb. This state of feebleness constitutes of itself a cachexia. (Squire. Ludlam.)

Treatment.—The management of this disease requires both skill and promptness. The extent of the deposit and blood poisoning is determined largely by the fever. Control this and the disease is arrested or greatly mitigated. Like typhoid fever the greater the malaise and muscular soreness, the more severe the disease. The two remedies that have been of greatest service in my hands have been *Bell.* and *Mercurius b jod.* The first corresponds to the febrile stage, while the latter meets the malaise, muscular soreness, and the profuse albuminous secretion of the mouth and throat which upon the tonsils becomes organized into false membrane. It also corresponds to our idea of the cause. In one severe case where there was aphonia, aphasia, stupor, and almost gangrene, *Merc.* promptly arrested the disease and the case rapidly recovered.

The cases need the closest attention and the remedy the most careful affiliation. We give a few of the most prominent symptoms:

Ammonium caust.—*Diphtheritic croup;* very hoarse, almost amounting to aphonia; low, guttural, husky cough, with smothered whoop, followed by suffocative spells, with great anguish; irritable and fretful; weak; moaning in sleep; hurried, labored, anxious breathing; pulse very rapid, feeble, wiry. Deep redness of the velum, its pillar, tonsils, posterior wall of pharynx, epiglottis, lower part of pharynx, and all of them covered with a white exudation as far as the eye can reach; intense pain in throat; great difficulty in swallowing; remarkable weakness and exhaustion, not in proportion to the short duration of the disease.

Apis mel.—Bright red color of the inflamed parts, with puffy, glossy varnished appearance; *small amount of pain accompanying intense and extensive inflammation;* puffiness and bloatedness of the subcutaneous tissue of the neck and face; tonsils swollen and red (more from inflammation of mucous membrane covering them); contraction and rawness of the throat, worse mornings; difficult swallowing from contraction; swelling and weakness of the muscles of the throat; pains in ears when swallowing; pain in the neck and shoulders, in the occiput, radiating in different directions, of a darting-cutting character, more external and on the affected side; affected parts covered with a dirty-gray exudation; thirstlessness; *prostration from beginning;* numb limbs; itchy-stinging rash; over-sensitiveness of the skin to touch; high fever; voice hoarse; rough; sensation as of rapid swelling of the lining membrane of the air passages; speaking painful; intense sensation of suffocation; can bear nothing about the throat; labored inspiration as in croup. Intense debility accompanying or following diphtheria.

Arnica.—General loss of strength; heaviness and paresis of right side (*Lach.* left); foul breath; burning in the throat, with anguish from internal heat; stitching posteriorly, as if some hard body were in the pharynx; noisy and difficult deglutition, prevented by a kind of vomiturition, as if the food could not pass downwards.

Arsenicum.—Epidemic diphtheria, with typhoid symptoms, or in the presence of severe morbus Brightii; great prostration and restlessness; thirst, but taking only a sip; gangrene; fetid breath; dysphagia; perspiration sticky; abdomen distended; exhausting diarrhœa and great anæmia; somnolence and occasional starting up to leave the bed. Valuable during convalescence.

Arsenicum iodat.—*Diphtheritic croup;* deposit covering mouth from fauces to outer edge of lips, and external auditory canal; foul breath; short difficult respiration and symptoms of adynamia.

Aurum triph.—Discharge of burning icherous fluid from the nose, excoriating nostrils and upper lip; nose stopped up, can only breathe with mouth open; tongue sore; red papillæ elevated; swelling of submaxillary glands; throat sore, excoriated, cannot swallow, excessive acrid salivation; sensation of *something hot in the throat*, more especially during inspiration; great restlessness, and throwing himself into all kinds of positions.

Baptisia.—Diphtheria, with dark membrane in the throat; offensive breath; dry, brown tongue; semi-comatose condition; little or no thirst; oppressed breathing unto suffocation on account of pulmonary congestion, the patient must go to the window for fresh air; very little pain in fauces in spite of œdema of the parts affected, especially of the posterior choanes; he can only swallow liquids; throat feels sore and contracted; prostration; chilliness of the lower limbs and back, with hot face and fever at night; stools dark and blood streaked.

Belladonna.—Great restlessness and fever; continual desire to swallow, and sensation as if he would choke if he did not; every attempt to swallow causes lachrymation; stitches in the throat and fauces; great difficulty in swallowing solids or fluids; drowsiness, yet inability to sleep; pupils enlarged; pain in throat aggravated by turning the head; will not lie down for fear of choking. Most useful in first stage, before exudation appears. Worse in the evening.

Bromine.—*Diphtheritic croup;* the disease may commence in larynx and travel upwards with hoarse and croupy cough, or passes from the fauces into the respiratory organs.

Cantharis.—*Burning* pain and soreness in the throat, with a scraping sensation and expectoration of blood; *marked disturbance of the urinary organs;* frequent desire to micturate, with burning and cutting pain, passes only a few drops at a time. Extreme prostration; sinking turns.

Capsicum.—Burning and soreness in the mouth and throat; congested appearance of the mucous membrane; fauces partially covered with the diphtheritic deposit; beating and throbbing in the head; rapid pulse, vertigo, and bleeding at the nose; chilliness in the back.

Carbolic acid.—Low form of fever; absence of pain; great accumulation of deposits spreading a most offensive fetor; excessive prostration, with dizziness and headache, pale face, loss of appetite, nausea, weak or thready pulse.

Chininum arsen.—Diphtheritic membranes on tonsils and fauces; swelling of maxillary glands; fetid breath; great prostration, especially lasting during convalescence.

Ignatia.—Right side more affected, although the exudation may be on both sides; delirium characterized by fear and dread; soreness of throat, greatest between the acts of deglutition; pain in the back of head, nuchæ, and sometimes in the ears.

Iodine.—Much glandular irritation; disease threatens to attack the larynx; formation of specks or patches of exudation with sore throat; enlargement of tonsils and of the glands of the neck; disinclination for food; difficulty of breathing; cough and alteration of voice.

Kali bich.—Croupous diphtheria; shrill, croupy cough, occasionally whistling and wheezing; rough, hoarse sound of voice, with difficulty of breathing, as though the lungs were stuffed with cotton; throat purple, with numerous isolated patches of greenish-yellow exudation all over the fauces; tongue, cheeks, gums, smelling like decayed meat; pains extending to the right ear, when swallowing; expectoration frequently streaked with blood; exudation tough and *firmly adhering*, spreading upwards into the nostrils and down into the larynx; tendency of diphtheritic deposits upon remote mucous membranes; great weakness; cachectic look; swollen glands. Worse about 3 A. M. Antidotes, *Merc.*

Kali permang.—*Odor of breath unbearable;* fluids taken by the mouth, returned by the nose; general and excessive prostration; great dyspnœa; foul diphtheritic exudation all over fauces.

Kreosote.—Acts well in scrofulous and lymphatic patients, with black softening and decomposition of the mucous membrane, with atony and extension of the softening, especially toward the œsophagus.

Lac caninum, (*Lactic acid*).—Scrofulous constitutions especially liable to diphtheria; white ulcers on the tonsils, which and the fauces are *covered with a yellowish-gray, curdy deposit;* dorsal pains, also in the head and limbs; coated tongue; chills followed by heat; profuse saliva saturating the pillow; constant inclination to swallow; profuse urination; profound or slight prostration; able to take nourishment; disease commences either right or left.

Lachesis.—Membrane commenced on left side, with tendency to spread to the right; very frequent pulse, very restless, and always worse after sleep; purple livid color of the inflamed parts, with dull, dry appearance, and little swelling: *intense pain accompanies an apparently small amount of inflammation;* deep redness of the tongue and fauces; discharge from nose and mouth fetid and excoriating; cannot bear to have the largnx or throat touched: dullness of the cerebral functions; prostration and *cardiac debility*, even before the exudation; extreme tenderness of the neck; cold, clammy perspiration; somnolency; delirium; *peculiar hard aching all over, so that position is constantly changed.*.

Lycopodium.— Diphtheritis, beginning in the nose, and the discharg runs down into the pharynx; or it spreads from the right side to the left; inability of breathing through the nostrils; much swelling and pain in throat, with spasms on swallowing; feeling of constriction in the nose, throat, and chest; projecting tongue and silly expression; perfect stupor; grinding of teeth, even when fully awake; diminished secretion of urine, with red sand in it.

Mercurius corros.— Useful when the exudation covers the entire fauces and extends into the nose, from which a profuse discharge flows; rapid destruction of parts. Antidotes, *Potass. chlor.*

Mercurius cyanuret.— *Putrid diphtheria*, beginning in the nasal cavities, (*Kali b.*) extending all over fauces, mouth, pharynx and larynx, which are coveréd by a grayish-leathery exudation and ulceration; incessant salivation; fœtor oris; laryngo-tracheal whistling; parotid and submaxillary glands engorged; excessive prostration; skin burning; voice extinguished.

Mercurius bijod. 3.— Deposit mostly in right side; patches mostly on left tonsil; velum elongated, must swallow from a collection of saliva or mucus, or from feeling of a lump in throat: livid purplish patches; discharge thin, offensive; hawking up white aud tough mucus; exudation limited, transparent and easily detached; enlarged glands. Tongue large, flabby, showing prints of teeth. Worse at night. Second stage.

Nitric acid.— Pricking in the throat, as from a splinter or piece of glass (also *Hepar*); difficult deglutition and very painful excessive salivation; fauces and glands swollen; fœtor oris; great uneasiness; violent fever; deep-seated, local affection.

Phytolacca dec.— Ulcerated sore throat; chills during evening and night; violent pains in forehead and occiput, back and limbs; great prostration; cannot stand; when rising up in bed, faint and dizzy; patient feels cold in the evening and during the night, with dryness in the throat and soreness in the morning; livid exudations upon tonsils and fauces; difficult deglutition and extreme sensitiveness of the tonsils; exudation mostly of a grayish color.

Potassium chlor.— Is a popular and Allopathic remedy, and may need to be antidoted.

Rhus tox.— Bloody saliva running out of child's mouth during sleep; parotid glands very swollen; transparent, jelly-like, reddish discharge from bowels during or after stool; typhoid condition.

Salicylic acid.— Excessive weakness and prostration; difficult deglutition; soft exudation; redness of buccal cavity and fauces.

Secale corn.— Loss of strength; rapid loss of sensibility; numbness of extremities; painful tingling and crawling on the tongue; dry gangrene; apathy; dilated pupils; burning pains of the affected parts; stammering speech. Absence of all reaction (*Carbo veg.*)

Sulphur.— Large yellow deposits all around the posterior wall of the pharynx, which is ulcerated and sloughing; very quick pulse, flashes of heat, frequent sinking spells; empty swallowing even more painful than that of liquids; inflamed parts purple; dryness of throat; slowly progressing cases. Cases that relapse.

Sulphuric acid.— Ulceration of throat with large exudations, thick, grayish or yellowish, sticky and tenacious; tonsils bright red; swallowing very difficult; liquids run out of the nose; speech and respiration difficult on account of the accumulation of exudation in fauces: excessive salivation; fœtor oris; pulse frequent, small, weak; apathy; somnolency; excessive paleness.

For the paralysis following diphtheria, *Gels.*, has been most successful; but *Caust.*, *Cuprum*, *Cocc.*, *Nux vom.*, *Arnica*, *Baryta*, *Plumbum*, *Rhus*, *Stannum*, *Sulphur*, *Thuja*, or *Zinc* may be indicated. In paralysis of the lungs, *Ant. tart.*, *Camphor*, *Mosch.* For the dropsical affections, *Arsenic*, *Bryonia*, *China*, *Chin. ars.*, etc., may be needed.

As adjuvants, gargling or penciling, or the spray with the atomizer using diluted alcohol, *Carbolic* or *Salicylic acid*, *liquid Calc. chlor.*, *Chlorate of Potassium* and hot water have all been recommended and used. As this is not a local disease I let the throat alone. The termination is (1) towards subsidence of the fever, disappearance of the deposit, or (2) a low typhoid type and death from muscular prostration; or (3) invasion of the larynx and lungs, and death from asphyxia. The croupous form should be treated as true croup. The successful remedy is *Kali bich.* low, and spray of *Calc. chlor.* Dr. Bennett, of Fitchburg, Mass., reports several cases cured by this method. Tracheotomy is some times successful when resorted to as early as the croupal symptoms appear. (See Croup).

Great attention should be given towards keeping the little patient quiet and feeding the system. The best diet is milk or beef-tea. When there is much aphasia cup custard may slip down when nothing else will. Stimulants unless there is threatened brain failure are not usually needed. In severe cases the patient should be kept *very* quiet.

DISEASES OF THE LARYNX.

DEVELOPMENT AND CONGENITAL MALFORMATIONS.

During fœtal life the pharynx and trachea exhibit no series of progressive phenomena that can be observed or followed in such a manner as to trace with exactness the various periods of their formation. Their existence and perfection are not of so great importance during intra-uterine life as that of the intestinal tube, kidneys, bladder, etc.; they do not exhibit, like these organs appreciable stages of formation; and from their first appearance, which occurs about the second or third month of conception, there is already distinguished a canal, enlarged at its superior part and divided inferiorly in a manner which enables us to recognize evidently the traces of the larynx and trachea; and at the third month transverse lines may be seen indicating the cartilaginous rings of the trachea. At six or seven months it is easy to distinguish the projections and depressions which form the ventricles and cords of the glottis. The mucous membrane which covers these parts is usually of a deep rose-color; this color is less vivid in the trachea where the internal membrane often appears in longitudinal folds, which disposition of the part permits an enlargement of the canal whenever it is distended with air. It is likewise common to find very clear and ropy mucosities covering and lubricating the walls of the trachea. At the period of birth, the cartilages, bones, and muscles of the larynx are perfectly developed, although small and very flexible; and the cartilages of the trachea perfectly distinct from each other, are soft and filled with blood, and there are often found transverse, red striæ, corresponding in infants at birth to the cartilages of the trachea, and which ought not to be taken for marks of inflammation. (Billard).

The cartilages of the larynx are hyaline, as the thyroid and cricoid cartilages. In certain parts of the arytenoid cartilages there is an elastic metamorphosis. The Wisbergian and Santorinian cartilages, with the epiglottis, are pure reticular cartilage. The triticeæn cartilages are formed of hyaline or connective tissue cartilaginous substance. The ligaments of the larynx present a considerable wealth of elastic tissue. The lower true vocal cords are purely elastic. The muscles are transversely striated. The mucous membrane, rather compact and likewise not poor in elastic elements, shows embedments of lymphoid cells, and contains racemose true mucous glands. Strongly stratified pavement epithelium covers the anterior surface of the epiglottis; there are not so many layers in that covering the posterior surface as far as the base; the same is also true of the lower vocal chords. (Frey).

At birth it is not unusual to find the larynx and trachea filled with mucous secretion, apparently without the existence of disease, to so great an extent as to interrupt, and even prevent entirely the function of respiration, producing in the new-born child complete asphyxia. The larynx, but more especially the glottis, remains of a very small size for a very long time, differing but little in a child of three years and one of twelve. This smallness of the size of the glottis, is the reason that affections of those parts that are attended with any tenacious secretion, or tumefaction of the lining membrane, are so highly dangerous in children, for a complete closure of the opening may ensue, even from slight causes. This condition occurs from the plastic exudation of croup, and in the œdematous state of the epiglottis, diseases remarkably fatal in young children. The different capacity of the opening in some instances, may also be one of the causes of the frequent attacks of suffocating diseases in some infants, while others are for years quite exempt from affections of this nature.

At the age of puberty, however, the difference is so great, that the glottis doubles in length and breadth in the course of a year; hence the remarkable difference observed in diseases affecting these organs at an early time of life, and after the period of puberty, when there is an almost entire exemption from those symptoms which characterize these affections in young children.

Congenital malformations of the larynx and trachea are of much less common occurrence than those of other organs. Complete absence of these parts occurs in cases of acephalia, or non-viable monsters, and is observed most frequently in connection with absence of the entire respiratory system. Billard relates an instance in which there was at birth a strongly marked defect of symmetry between the two lateral portions of the larynx. The larynx may be extremely small or very narrow; absence or imperforation of the epiglottis, and of some one of the cartilages of the larynx have also been observed. Absence of the trachea has been noted with presence of the lungs and larynx, in such instances the latter is in immediate connection with the bronchi. Atresia, blind termination of the trachea or closure of both branches of the trachea are more of anatomical than clinical interest. Rossi mentions a case in which there was closure of the glottis by a membrane, in addition closure of both branches of the trachea. Communication of the œsophagus with the posterior wall of the trachea, in most cases, occurs in such a manner that the pharynx terminates in a blind sac, and the œsophagus opens directly into the trachea.

Further malformations are: Absence of individual tracheal cartilages; coalescence of several tracheal cartilages in one; excessive number of cartilages and their abnormal division longitudinally or horizontally, as well as their abnormal configuration, size and texture. Sometimes the trachea as a whole is too short, too narrow, undivided below or unusually curved.

DISEASES DEVELOPED BEFORE OR DURING BIRTH.

These are worthy of attention. Billard did not see any evident trace of inflammation during intra-uterine life, but he often met with a very considerable sanguineous congestion in premature children; several times this congestion, known by a deep redness of the laryngo-tracheal mucous membrane was accompanied by a sanguineous exhalation, which extended even to the bronchiæ so that it appeared probable that it was the result of an afflux of blood towards these parts either during the latter period of intra-uterine life or during birth.

There is a condition of the larynx and trachea, which without having reference to any lesion whatever of the mucous membrane, does not the less merit the notice of physicians, and especially of accoucheurs. Billard alludes to the abundant mucosity which in some infants obstructs the larynx and trachea, to that degree as materially to hinder the establishment of respiration. This affection is usually accompanied with a peculiar alteration of the cry which is husky and almost always incomplete. The reprise is not heard but momentarily, and when heard is hoarse and jerking. It is probable that this mucosity was accumulated in the larynx and trachea before birth. The trifling effects of this accumulation are of short duration; a few efforts of inspiration and expiration are sufficient to render the cry free and perfect. The accoucheur may assist the discharge of this mucosity with the fingers. After birth, the larynx is usually found to be congested, the infection often continuing for some time, but gradually disappearing. Ecchymoses sometimes exist in the cellular tissue surrounding the larynx, giving the impression that external violence had been used. Sometimes blood is exhaled upon the laryngeal surface.

LARYNGEAL CATARRH — SIMPLE LARYNGITIS WITHOUT SPASM.

Croupal cry, cough and voice belong to several diseases; as acute laryngitis, chronic laryngitis, spasmodic laryngitis, membranous laryngitis, diphtheritic laryngitis, and croupous pneumonia.

Acute laryngitis consists of simple erythematous or catarrhal inflammation of the mucous membrane of the larynx, unattended with spasmodic closure of that organ. It is sometimes attended with ulceration, but is unaccompanied by exudation of false membrane. The frequency of the disease during infancy and childhood, is very considerable, so much so, that not a winter passes without many well marked cases. The disease occurs at all periods of childhood but seems to be more frequent under than over five years of age. Of sixty-two well-marked cases met with in which the age was noted, fifty occurred in children under, and only twelve in those over that age. Of the former the great majority were under two years of age. The disease is very apt to occur in the course of other maladies, and particularly of measles, small pox, scarlet fever, bronchitis and pneumonia.

Anatomical Characters.— In simple acute laryngitis the mucous membrane of the larynx presents the usual appearance of mucous surfaces when inflamed, namely, redness and thickening. It is also somewhat softened. Ulcerations rarely, perhaps never, occur in primary acute laryngitis. When present they are, with few exceptions, referable to the tubercular or syphilitic cachexia. They are small, and are situated on or up near the vocal cords. The inflammation in simple acute laryngitis usually extends over the whole surface of the larynx, and also to the upper part of the trachea. It may be uniform, or more intense in one place than another, and like other mucous inflammations is accompanied by more or less rapid proliferation and exfoliation of epithelial cells. In most cases of simple laryngitis, whether acute or chronic, the inflammation extends to the fauces producing redness and thickening (though generally moderate) of the mucous membrane which covers it. Examination of the fauces therefore aids in diagnosis.

Symptoms.— The attack generally begins with a slight form and an alteration of the *voice* or *cry*. In infants the change in cry alone exists, so that to detect the disease it is necessary to hear the child cry.

In older children the same alteration of the cry is present, but there is in addition a change in the voice consisting of various degrees of hoarseness. These symptoms may be so slight as to be observed in the cry only when it is strong and forcible, and in the voice so as to strike the ear of one accustomed to be with the child; or they may be so marked as to be heard in the faintest cry that is uttered, and to be evident in the voice in a moment to the most careless observer, or there may be complete aphonia. They are often intermittent in this form, and are generally most marked in the after part of the day and during the night. Simultaneously with this symptom, or very soon after, *cough* occurs. This is generally hoarse and rough, and early in the attack, dry; at a later period it usually becomes loose, and as this change occurs loses its character of hoarseness. The frequency of the cough is variable, but usually moderate; as a general rule it is most frequent in the evening, and early in the morning, particularly in infants and young children. The disease is almost always preceded and attended with some coryza, which, in the early stage is marked by sneezing and slight incrustations about the nostrils, and at a later period by mucus and sero-mucous discharges. The respiration remains natural, except that it is sometimes nasal, and sometimes a little accelerated. There is rarely any fever, or it is slight, and occurs only at night. There is no pain in the larynx. In some cases, the hoarseness of the cry, voice or cough scarcely exists, or it is but slightly marked, and the only symptom is a dry, hard, teasing and paroxysmal cough, which from its sound evidently proceeds from the larynx and resembles very much that produced by the tickling of a foreign body in the throat.

The symptoms of this disease instead of being of a mild character just described, may be much more severe. The cough is more frequent, hoarse, troublesome and painful, from the scraping and tearing sensations it occasions in the larynx. The voice is more affected becoming from husky, more and more hoarse, though it is very unusual for it to become weak and whispering as in membranous and severe spasmodic croup. The respiration is decidedly accelerated, giving rise to slight dyspnœa and there is more or less fever, which is most marked usually in the after part of the day and in the night. The pulse is more frequent than in health, rising to 120 or 130 in the minute; the skin is hot and dry; the child is thirsty, restless, and uncomfortable. After a few days usually, the cough becomes loose and easy and ceases to be painful. The voice loses its hoarse tone gradually, the fever disappears, the appetite and gayety return, and the child regains its usual health.

In nearly all cases of this form of laryngitis, there is found upon examination of the fauces, more or less decided inflammation of the tonsils, soft palate and pharynx.

Diagnosis.—The diagnosis is very easy. The hoarseness of the cry, voice and cough, the redness of the mucous membrane of the pharynx and the absence ot general symptoms will distinguish it from any other affection. In somewhat severer cases of this form, in which the cough is more frequent and harassing, the general symptoms more strongly marked, and the respiration somewhat hurried and oppressed, the attack at first view may present the appearance of bronchitis or pneumonia, from which it is to be distinguished by physical exploration. (Meigs & Pepper).

Prognosis.—Simple acute laryngitis subsides in from one to two weeks, occasionally it lasts three or four weeks before the cough entirely disappears. Death, which is rare, is attributable to some complication. (Smith).

The treatment of acute laryngitis consists in selecting the appropriate remedy which is usually all that is sufficient. This remedy is usually *Belladonna*. A croupal cry or cough is usually such an occasion of alarm, that those not versed in Homœopathy usually resort to an emetic. and thus complicate the case, giving us often bronchitis as well. (See other forms).

CHRONIC LARYNGITIS.

Chronic laryngitis is much less frequent than the acute form. Its anatomical characters are similar to those in other chronic inflammations affecting mucous surfaces, namely, thickening, and more or less infiltration of the mucous membrane; increased proliferation and exfoliation of the epithelial cells, and increased functional activity of the muciparous follicles.

In the adult, chronic laryngitis is dependent on the syphilitic or tubercular disease. In the child it occurs not infrequently in connection with tubercles in the lungs or bronchial glands. Such patients are emaciated, and have the ordinary symptoms of tuberculosis. But occasionally chronic laryngitis occurs in young children, usually infants in whom there is no emaciation or other evidence of cachexia.

Smith mentions twelve such cases, mostly nursing infants. Some of these had mild bronchitis; but it was obviously subordinate to the laryngitis. Their respiration was noisy and harsh, continuing of this character day after day and week after week. The cough was also harsh and loud, conveying the idea of thickening, and relaxation of the mucous membrane covering the vocal cords. Their respiration was not notably accelerated, and the blood was apparently fully oxygenated, though the friends were often alarmed by the noisy breathing and cough.

In this form of chronic laryngitis there is little expectoration, the fever is slight or absent, the appetite remains unimpaired, and the general condition of the child is good. There are from time to time exacerbations, and occasionally improvement is such as to encourage the hope of speedy cure, but in most cases there is no complete intermission in the disease until final recovery. Recovery takes place in from three or four months to one year.

This chronic laryngitis is to be distinguished from frequent attacks of acute laryngitis, which are due to fresh exposures, and are accompanied by the ordinary symptoms of the acute disease. It is to be distinguished from protracted acute laryngitis by its longer duration, the greater thickening of the inflamed membrane, and consequently more noisy respiration.

Anatomical Lesions.— These consist of simple inflammation of the mucous membrane, with its various effects. The membrane varies in color between a deep-rose and violet-red, which may be either uniform or only in patches. In severer cases, the tissue is at the same time, softened or roughened and sometimes thickened. When redness, softening and thickening are present, the disease is confined to certain parts, and commonly to the epiglottis and internal portions of the vocal chords, but when redness alone exists, it usually affects the whole of the larynx, and sometimes extends to the trachea. Cases in whom ulceration is present are almost always secondary, generally small, few in number, very superficial, linear in shape, and usually on the vocal chords.

In the adult œdema of the glottis occasionally results from laryngitis, but in the child there is little danger this will occur, in consequence of the anatomical character of the larynx. In early life there is but little sub-mucous areolar tissue in the larynx, and therefore less sub-mucous infiltration or effusion during inflammation. The structural changes occurring in the laryngitis of infancy and childhood relate almost exclusively to the mucous membrane. (Smith).

There is also an obstinate, troublesome cough in children laboring under this affection. This cough is harsh, rough, and so to speak, tearing in its character. It often sounds, especially towards evening and in the early part of the night, croupal in its tone. It is usually very frequent, not so much, however, during the day as in the evening and at night. It is very generally increased by the horizontal position, so that when the child is put to bed, it will begin to cough violently and almost incessantly, and will continue to do so for one, two, and even three or four hours. The cough is so constant and so severe as to cause the greatest disturbance, not only to the patient (who will toss in the most restless manner) but to the mother or attendants who are excessively annoyed, and sometimes alarmed by its constancy and obstinacy. Children who become subject to this species of cough, often have repeated attacks during the cold seasons of the year, the slightest exposure, sometimes bringing them on. During the day, the child generally seems perfectly well, or at most merely a little pale and languid, and coughs but moderately, but as soon as night comes on, and especially when he is put to bed, the cough begins and goes on as described above. In some cases, this unusual susceptibility of the laryngeal mucous membrane seems to be founded upon a congenital or constitutional idiosyncrasy, in others it is the result of post natal influnces, particularly insufficient clothing. (Meigs & Pepper).

In some instances the uvula is lengthened from relaxation of the mucous membrane and thus provokes cough in the recumbent posture.

Therapeutics.—In the acute form, *Aconite*, *Bell.*, *Brom.*, *Cham.*, *Dros.*, *Hepar*, *Iodine*, *Ipecac*, *Lach.*, *Merc.*, *Senega*, *Spongia*, or *Tartar emetic* are the chief remedies. For the chronic form, *Argentum*, *Arnica*, *Caust.*, *Carbo veg.*, *Dulc.*, *Phos.*, *Puls.*, *Rhus* and *Sulph.* are the principal ones. The indications are:

Aconite.—Nervous, feverish restlessness.

Arnica.—Child cries *before* it coughs (*Bell.* after). Dry, short, constant cough. Traumatic cases.

Argentum.—Dry, spasmodic cough; hoarseness and loss of voice. Posterior wall of pharynx also swollen. Chronic form.

Belladonna.—The attack is ushered in suddenly in the afternoon, or after lying down; face flushed, eyes injected; swallowing difficult and painful. Starting in sleep.

Bromine.—Much rattling in the larynx when coughing; hoarseness and spasmodic closure of the glottis. Fair children.

Carbo veg.—Long-lasting case, seemingly dependent upon the debility from insufficient nourishment. Tongue and fauces show a venous stasis. (Compare *Phos.*)

Causticum.—Frequent attacks of suffocation during inspiration as if some one grasped the throat, arresting the breathing for the moment. Dry, hollow, hoarse cough. Chronic form.

Chamomilla.—Not often indicated. The great distress the child seems to be out of all proportion to the real disease. Relief from motion would suggest this remedy.

Drosera.—Attacks of suffocation. When hooping cough is about. Cough made up of quickly succeeding barks which do not allow recovery of breath.

Dulcamara.—(See Spasmodic Laryngitis).

Hepar.—Laryngeal catarrh, with rattling of mucus in throat which is expectorated or dislodged with difficulty. The cough is loose but still hoarse.

Iodine.—Has tightness and constriction about the larynx, with soreness and hoarseness; constant clearing of the throat; voice hoarse and husky. Chronic form with ulceration. Dark children.

Ipecac is often misused, being given when not indicated. Catarrhal form, with almost constant nausea.

Kali bich.—Chronic form, follicular laryngitis; swelling of the tissues and secretion of gray mucus. Worse towards morning, the tough mucus causes gagging and strangling.

Kali iod.—Laryngeal irritation, dry cough; burning tickling in the throat. Syphilitic or mercurialized cases.

Lachesis.—Chronic form; very markedly worse after sleeping. Child pulls at the throat. Hoarseness and dryness.

Mercurius.—Tongue large and flabby; much saliva; complicated with angina faucicum.

Nitric acid.—Long-standing; short, dry cough, continuing all day; very troublesome when first lying down at night, but not waking the child from sleep. Chronic, hoarse cough, without expectoration.

Petroleum.—Coal oil tied about the neck is a domestic remedy.

Phosphorus.—Chronic weakness of the vocal organs; violent tickling in larynx when speaking; dry, spasmodic cough, with constriction of the throat.

Sanguinaria.— Acute form, dryness, soreness, swelling and redness. Polypi of the larynx and nasal fossæ.

Seneca.— Copious accumulation of mucus in the air tubes.

Sulphur.— Arterial and venous vascular irritability; great impressibility of the skin; rheumatic, herpetic, lymphatic diathesis.

SPASMODIC LARYNGITIS. PSEUDO-CROUP. FALSE CROUP.

This is the most common form of croup. It sounds alarming but is really not so. Children in some families, are more liable to this disease than others, so that a hereditary tendency would seem to exert itself in such instances. Exposure to cold, especially in cold, dry weather, draughts, the inhalation of contaminated air and overstraining through excessive crying, also stand in a causative relation. It is frequently an accompaniment of measles and hooping cough, ulceration and new formations in the larynx, and is met with more rarely in small pox, scarlet fever and typhoid. (Steiner).

Narrowness of the rima glottis and an excitable state of the nervous system, both of which are common in early childhood are predisposing causes. (Smith).

It attacks all ages, most frequently those children in whom the eruption of the last molars is still in progress, but does not, however, spare older ones; while in small children, who still labor under the effects of cutting the incisor teeth, the spasmodic form of laryngeal affection, without any catarrh, is the most frequent variety. (Vogel).

Symptoms.— Spasmodic laryngitis begins abruptly. Singularly it commences nearly always at night, after the first sleep, between ten and twelve o'clock. The first attack usually occurs suddenly on the second or third night after the patient has manifested the usual signs of a cold. The child awakes from sleep with a sense of suffocation, loud stridor in inspiration, a dull, barking, dry cough, alternating with a doleful cry, the voice hoarse and toneless, active movements of the accessory muscles of respiration, inspiratory sinking inwards of the epigastrium and false ribs, slight cyanosis, great restlessness and anxiety. Examination of the throat shows the presence of simple catarrh without any croupous or diphtheritic membrane. The temperature is either normal or only slightly elevated. With proper treatment the attack of laryngeal stenosis generally lasts but a few hours; the stridor gradually diminishes and with it the dyspnœa; the breathing becomes more quiet; moist rales make their appearance in the chest; the patient perspires and passes water more abundantly; and the drowsiness soon passes into a quiet slumber interrupted from time to time only by a hoarse, barking (or ringing, croup-like) cough, which alarms the parents anew.

On the following morning the child is usually almost entirely well, and presents no symptoms except simple catarrh and slight hoarseness. In many cases the attack is not repeated, but not unfrequently it returns the next night, without the course of the disease being thereby rendered more unfavorable,

The so-called attacks of croup are very apt to recur with every acute catarrh of the upper respiratory passages, and it is not uncommon to find children who are said by their parents to have had "croup" half a dozen times. It is hardly necessary to say that in all such cases the affection was merely catarrhal, since recurrences of true croup are extremely rare. These attacks are merely an evidence of unusual vulnerability of the respiratory mucous membrane in children who are hereditarily affected, and such attacks are to be regarded as important indications for subsequent medical treatment. (Ziemssen).

The *treatment* of spasmodic croup has been so mixed up with that of membranous croup and laryngitis (simplex) that the literature is very unsatisfactory. The advice of Bœnninghausen to give *Aconite*, *Spongia* and *Hepar* is about as good as any routine treatment.

Croserio says: "The first medicine to employ when the croup declares itself, is *Aconite;* put three globules of the 18th attenuation in a half-glass of water, and administer a teaspoonful every five minutes; lengthening the intervals when the violence of the febrile symptoms abate. Four or five hours after the commencement of the use of this medicine, the force of this fever is diminished, the face is not so red; we may then give *Spongia* 30 also in half a glass of water, a teaspoonful every half hour; increasing the intervals between the doses in proportion as the violence of the cough and suffocation diminish. Ordinarily, after a few doses of *Aconite*, the child goes to sleep, and falls into a profuse perspiration, which we should take good care not to interrupt; he awakes after an hour or two with a cough which is much less violent; the violence of the disease is subdued. When after twenty-four or thirty-six hours of the use of *Spongia*, the cough remains hollow, we should give *Hepar sulphur*; some physicians recommend giving *Spongia* and *Hepar* alternately every two hours. *Sambucus* is indicated when notwithstanding the diminution of the cough, the suffocation continues. In this disease the greatest care should be taken to avoid chills; the child's linen should not be changed until the cure is complete, in order to avoid the relapses which are so liable to occur." (Homœopathic Manual of Obstetrics, p. 149).

Bromine, *Kali brom.*, *Lobelia*, *Naja*, *Sambucus* are also given as indicated in spasmodic croup. *Aconite* is often the only remedy needed as it corresponds to the spasm, the restlessness, the anxiety and the fever that arises. One or two doses is all that is usually necessary. The children attacked with this form of croup are the nervo-sanguine or—bilious, *i. e.*, the nervous active, while membranous croup attacks lymphatic children as a rule. The more nervous the child the longer the spasm continues. The *Aconite* picture may be colored as follows: The child is in agony, impatient, throws itself about, high fever, dry skin, dry and short cough, every expiration ending with a hoarse, hacking cough. *Loud breathing during expiration.* From exposure to dry cold winds. The *Aconite* cases come on in the afternoon or in the evening when the system is at its lowest.

Lobelia cases resemble those of *Aconite* with this difference; there is more dyspnœa and the spasm affects the œsophageal muscles, impeding deglutition as well as respiration. Older children will describe a sensation of a lump in the throat, (*Ign.*) but the constant ringing cough, stridulous breathing and great anguish and fear of suffocation distinguish the case from *Ignatia* or *Aconite*.

The *Spongia* cases occurs usually after the child has been asleep. It awakes *before midnight* with suffocation and short, hard barking cough. Slow, loud wheezing and *sawing breathing* between the suffocative fits. The children are nervo-sanguine.

Bromine is sometimes indicated in spasmodic or suffocative croup. The voice is hoarse, whistling, croupy; gasping for breath; much dry, wheezing cough without much expectoration. Fair children.

Kali brom. is also sometimes indicated in spasmodic croup. Child awakens suddenly from a sound sleep by a sense of suffocation, with a peculiar ringing, dry, brassy cough and hurried breathing; the child is agitated, face flushed, eyes suffused and bloodshot. After one or two hours the child falls asleep and *breathes easily and naturally* only to awaken again in a similar cough paroxysm; hyperæsthesia of the laryngeal nerves, followed by loss of sensibility in the larynx: hoarseness extremely painful and disagreeable, hacking cough, with paleness of the face and compression of the head. Remission during the daytime.

The *Naja* cases have clogging up of the larynx with thick mucus and are not strictly due to spasm. It may be indicated where the spasms has persisted. Then there will be constant tickling coughing, hoarseness, gasping for breath for several hours; breathing laborious. The thick mucus is raised with difficulty.

Sambucus is indicated where spasm of the epiglottis complicates the spasm of the larynx. During sleep *after midnight* the child is attacked with quick wheezing, crowing, breathing, with suffocative attacks. Frequent waking as if in a fright, with fear of suffocation; mouth and eyes being half open. Dry heat during sleep; profuse perspiration only after awaking, *dread of being uncovered.*

Hepar is indicated after the spasm is relieved, and there is a loose hoarse cough; worse towards evening, with a little fever, due to the obstruction of the mucus.

A cold or warm water bandage about the throat often relieves the spasm as promptly as any remedy. It may be used as auxillary. Care should be taken that the child does not get wet and take cold, and the second state be worse than the first.

This form of croup ought to be relieved in about an hour, but the fright of the attendants may serve to prolong it. The physician's first duty is to quiet the fears of all. If properly managed there is no sequelæ, but if *Sirup of Ipecac* (*Hive sirup*) is given, we will be apt to have a bronchitis, or possibly a pneumonia to manage. *Bryonia*, *Hepar*, *Ars.* or *Ipecac* may then be indicated.

ŒDEMA OF THE GLOTTIS.

This is not of frequent occurrence due to the anatomical fact that in infants and young children the submucous areolar tissue is very scanty, and cannot be infiltrated to a great extent in ordinary inflammation. When the steam of boiling water is inhaled, however, or when caustic liquids have been swallowed, this tissue becomes greatly swollen, and thus interferes with respiration.

Treatment.—If due to scalds by caustics, special attention should be given to antidote the particular substance. It would be difficult to apply anything to the scalded surface, but oil about the neck may possibly reach it by absorption. Such remedies as *Apis*, *Canth.*, *Ars.*, *Arum*, *Lach.* In œdema in adults, *China* and *Stram.* are by Raue deemed, perhaps, the most important. (See Spasm of the Glottis).

MEMBRANOUS CROUP. PSEUDO - MEMBRANOUS LARYNGITIS. CYANCHE TRACHITIS. PSEUDO-MEMBRANOUS CROUP. CROUPOUS LARYNGITIS. PSEUDO-MEMBRANOUS ANGINA.

The word croup is of English-*Scotch* origin, and originally signified strangulation. This disease is an acute inflammation of the mucous membrane of the larynx, attended with the exudation of false membrane, not connected with any special alteration of the blood crasis, and though it may pass downwards into the trachea, never passes upwards into the pharynx. (Meigs & Pepper). In diphtheria the lesion is similar to that of croup, only with this difference, that in croup the exudation takes place *upon* the free surface of the mucous membrane, while in diphtheria it occurs at the same time *within* the tissues and thus produces necrosis andloss of substance of the mucous membrane.

The male sex is more frequently affected than the female and it has been observed that the Israelites are especially predisposed to it. Strong, well-fed, hearty children are no more liable to croup than those who are feeble, delicate or affected with other diseases. Hereditary predisposition plays a certain part in its occurrence. In some families membranous croup is comparatively frequent, while in others it is unknown. It rarely occurs a second time and all reports of the disease recurring three, five or ten times are fabulous, and refer only to pseudo-croup which may attack a child frequently. The season of the year, the weather and the nature of the soil are etiological factors, and croup has been found to be most prevalent during cold, moist, changeable weather, and in many instances the attack seems to be immediately due to exposure to sudden changes of temperature, or to cutting north and northwest winds. Primary or true croup is not a contagious disease. By secondary or symptomatic croup is meant that form which occurs in the course of acute infectious or general constitutional dieases, pyæmic processes, and other acute or chronic affections. Of the acute exanthemata, measles is the one most frequently complicated with laryngeal croup. This complication generally occurs during the stage of desquamation, more rarely at the height of the eruption. Pseudo-croup, when it occurs in such cases is usually a prodromal symptom. (Steiner).

Anatomical Lesions.—The false membrane may cover the whole mucous membrane of the larynx, and extend into the pharynx (?) trachea and bronchia; or it may be confined to the larynx, either forming a complete lining to the cavity of that organ, or consisting merely of patches of various sizes, with intervals of mucous membrane destitute of exudation. In the larynx, trachea and even the primitive bronchi it may appear merely as patches of various sizes, with intervening spaces of vascular mucous membrane, but in the smaller air passages it usually takes the form of complete tubes lining the bronchus. In some cases such tubular casts may be formed continuously from the larynx down to the minute bronchioles, completely lining the air passages. The false membrane is commonly of a yellowish-white color and from the fifth of a line to a line in thickness. Its consistence is generally considerable, and it is usually somewhat elastic; the more white and fibrous varieties passes a degree of firmness and toughness that renders it difficult to tear the membrane, or tease it out with needles. It is an almost invariable rule, that the membrane lining the upper part of the air passages is more white and firm than that found in the smaller bronchi; so that it frequently happens, that on drawing out the firm, white, tubular membrane lining the larynx, trachea and primary bronchi, it is seen to terminate in branches which grow progressively softer, more yellow and purulent, as they become smaller and smaller. The free surface of the pseudo-membrane is usually covered with puriform mucus, while the attached surface is adherent with various degrees of force to the mucous membrane beneath. In the larynx and trachea it is often necessary to employ a good deal of force to separate the exudation from the mucous membrane, and innumerable little fibres are seen passing from one to the other, as though they were processes of exudation dipping into the minute orifices of the mucous follicles.

The false membranes consist mainly of fibrin blended with mucus in various proportions. On microscopic examination they present a more or less close fibrous basis, consisting of interwoven fine fibrils, with imbedded cells in varying number; these cells presenting the ordinary appearances of exudation corpuscles, being round, granular and containing from one to three small nuclei. The mucous membrane beneath the exudation, presents various shades of redness, or it is purplish, or ecchymosed and blackish. It is also swollen and may be slightly softened or friable, and has a dull excoriated appearance, though actual ulceration very rarely exists.

There is also vascularity, though usually to a less marked degree of the bronchial mucous membrane at the points where no exudation exists.

The lungs present some abnormal condition in the great majority of cases. Bronchitis and pneumonia are frequent complications of this disease; and in addition there is often collapse of larger or smaller portions of lung-tissue from occlusion of some bronchus by the pseudo-membrane. In other instances, or frequently in conjunction with collapse of portions of the lungs, the violent respiratory efforts induce either vesicular or even interstitial emphysema, especially of the anterior borders of the lungs.

In the secondary croup of measles, the appearances are very similar to those observed in primary cases, while in that of scarlet fever the exudation is less consistent and less uniformly spread over the diseased part. (Meigs & Pepper).

Symptoms.—The disease generally comes on *gradually*, taking four to eight days to become fully developed. Its *first stage* is attended by few symptoms that could distinguish it from ordinary catarrh. Slight fever, drowsiness, suffusion of the eyes, and deflexion from the nose, attend it. The respiration is not perceptibly disturbed, and the cough, though frequent, presents no peculiar character. There is besides, occasional complaint of slight sore throat, or of uneasy sensation about the larynx, but so slight as scarcely to attract attention, and not sufficient to cause any alarm.

The duration of this stage is very variable; nor is there any regularity in the mode of its transition into *the second stage*. In the majority of cases, the transition takes place gradually; but thirty-six hours would seldom pass without the supervention of some symptom which to the well schooled observer, would betray the nature of the coming danger. Most symptoms may continue unchanged perhaps scarcely aggravated, but a slight modification takes place in the character of the cough, which now becomes attended with a peculiar ringing sound, difficult to describe, but when once heard not easily forgotten. This peculiarity in the cough very often precedes any change in the respiration and may sometimes be so slight as scarcely to attract the parent's notice at the time, and to be remembered only when the full development of the disease leads to inquiries as to how the attack came on. Soon after this modification of the cough has become perceptible or even simultaneous with it, the respiration undergoes a change. The act of inspiration becomes prolonged and is attended with stridor. It often happens that these two pathognomonic symptoms first come on, or at least first excite attention in the night, and that a child who at bed time was supposed to ail nothing or at most to have a slight cold, awakes suddenly with ringing cough and stridulous breathing, frequently in a state of alarm with marked dyspnœa. Through the whole course of the disease, indeed, an obvious tendency exists to nocturnal exacerbations and to remissions as the morning approaches. In whatever manner these symptoms may have come on, they will not continue for many hours, without being attended by increase of fever, by acceleration and soon by difficulty of respiration. The skin becomes hot and dry, the face flushed, the breathing hurried, the cough frequent, the pulse full and quick, the child dull, fretful and passionate. For a few minutes it may appear cheerful, may turn to its playthings and breathe more naturally, though the peculiar respiratory sound never ceases altogether. Soon, however, the dyspnœa returns with increased intensity; the whole chest heaves with the inspiratory effort, which is more prolonged and attended with great stridor. During it, perspiration breaks out at every pore and the veins of the neck and face become greatly distended Short and forcible expiration follows, and after this state of dyspnœa has lasted for some minutes, an interval of comparative ease succeeds. The child now falls asleep exhausted; but during sleep, the sound attending respiration is heard in an exaggerated degree. Though the drowsiness is great, sleep is uneasy, and frequently interrupted by violent startings, in spite of which the child may still sleep on. After some minutes he awakes in a state of terror, to pass through another paroxysm similar to the preceding one, though more severe. (West). The hoarseness increases and becomes more *permanent.* The cough which is at first shrill and short, becomes barking, and after awhile completely toneless. When the patient cries loudly, or has a violent fit of coughing there is still heard, however, a hoarse, barking sound, which now and then change from a bass to a high falsetto tone. (Steiner). This is due to the coming together for an instant of the swollen vocal chords.

The cough does not increase in severity in proportion as the disease advances; it is unattended by expectoration, or at most a little mucus is spit up but without any relief. Although the paroxysms of dyspnœa are not dependent on the cough, they are sometimes provoked by it, and the two or three inspirations next following an effort of coughing are often attended with increased stridor.

There is almost always much eagerness for drink and deglutition is generally well performed. The fauces are often red, though their redness bears no direct proportion to the intensity of the croupal symptoms; and there is frequently considerable tenderness of the larynx. The tongue is red at the tip and edges, but coated in the centre and at the back with thick, white fur; the bowels are rather constipated and the appetite for food is entirely lost.

As the disease advances, the paroxysms become less marked, or rather the intermissions grow less distinct and the child is constantly engaged with the effort to breathe. The cough now sometimes ceases altogether, and the breathing frequently becomes sibilant rather than stridulous. The child throws its head back as far as possible, in order to increase the capacity of the trachea; the chest is heaved violently at each effort to inspire, during which its lateral region becomes flattened, and all the soft parts of its parietes recede indicating the inadequacy of the attempt to fill them; the larynx is depressed forcibly towards the sternum, while the abdominal muscles co-operate energetically in expiration. (West).

This symptom depends upon the rarefaction of the air within the thorax, when dilated during stricture of the glottis. When the air within the chest becomes rarified, the pressure upon the thoracic surface of the diaphragm becoming far lighter than that upon its abdominal surface, it yields, and is forcibly pushed upward, the xyphoid and costal cartilages being likewise drawn in by the inspiration. This is easy of comprehension, if we only bear in mind the mechanism of normal respiration. If the air can enter the air passages with freedom, the diaphragm, upon contracting, causes its *pars-tendinea* to descend, but produces no incurvation of the ribs; for their resisting power is far greater than that encountered by the diaphragm in the elasticity of the lung, or in the feeble pressure of the abdominal viscera.

If, however, the tendinous centre be drawn up by the rarefaction of the air in the lungs, or if it be only fixed and hindered from moving downward, the inspiratory contractions of the muscles of the diaphragm must then of necessity, cause the arch of the ribs to curve inward. (Niemeyer). In addition the face is heavy and anxious, the eyes are dull, the lips livid, the skin dry and the extremities cold; or clammy sweats bedew the surface. The respiration is hurried, unequal and irregular and the pulse is very frequent and very feeble. Though no remissions now occur, there are frequent exacerbations, in which the child throws itself about and puts its hand to its throat, as though to tear away some obstacle to the admission of air, while helpless hopeless agony is depicted on its countenance. In the midst of these sufferings the patient dies, or coma or convulsions come on and close the scene.

It is not always, however, that the *last stage* of croup is attended by such distressing symptoms. The treatment employed may seem to have mitigated the severity of the disease; the restlessness may give place to ease, the burning skin may grow moist, the respiration may become tranquil, the cough loosen with but little clangor; expectoration may be easy, and a wheezing attended with a very slight croupy sound, may be the only indication of the dangerous disease under which the patient is suffering. This apparent amendment may continue for a few hours, and then be succeeded by a return of all the former symptoms, and soon be followed by death; or the mitigation of the disease may be accompanied with great drowsiness, which, however, does not excite alarm, since it is very naturally attributed to the exhaustion, produced by the disease. During sleep, the respiration is deep and tranquil, like that of a person in a sound slumber; it is indeed attended by a kind of wheeze, but presents little of the croupy stridor; and when awake the child is quite sensible and even cheerful. After a time, however, it becomes difficult thoroughly to arouse him; the pulse grows more rapid, the moisture on the skin changes almost imperceptibly to a cold clammy sweat, and convulsive twitchings of the angles of the mouth occasionally disturb the repose of the features. Silently but surely the exudation has been making progress, and when the alarm is taken, it is too late; the stupor deepens and the child dies comatose, or rouses only to spend its last hours in the vain struggle for health, and embittered by all the painful circumstances which ordinarily attend the suffocative stage of croup.

The diagnosis of croup is not difficult. The diseases which it may be confounded with are false croup, diphtheritic croup and croupous pneumonia. The gradual onset of the disease, the absence of sore throat and of bronchial symptoms will serve to differentiate. The morning is the best time to make the diagnosis.

The duration is from three to thirteen days. Death has occurred in three days, but such cases are rare. Some contend that it takes nine days to develop the membrane.

The prognosis of croup must always be guarded, since the disease is one of the most dangerous to which childhood is liable. Much depends upon the patient being seen at an early stage of the disease; and the prospect of recovery is generally very small if no treatment should have been adopted until after the full development of the symptoms. The presence of bronchitis, and, still more of pneumonia, adds greatly to the dangers of the affection, and would induce us to form a very unfavorable opinion of the chances of recovery. A second attack is generally less serious than the first; and cases in which catarrhal symptoms have preceded the seizure for several days are more amenable to treatment than those in which the premonitory stage has been short or altogether absent. Diminution of the dyspnœa in the intervals of the cough — a louder and looser cough, attended with expectoration or vomiting of muco-purulent matter, intermingled with shreds of false membrane — a less suppressed voice, less anxiety and less restlessness — all indicate that the disease is abating. Much caution, however, must be exercised in drawing a favorable conclusion from a diminution of the severity of the symptoms until such improvement has continued for twenty-four hours at least. In all but the most acute cases of croup the remittent character of the disease is very apparent; and it is well to bear in mind that the fatal termination usually takes place with extreme rapidity, when an exacerbation of the symptoms follows soon after a manifest remission of their intensity. The symptoms of extinction of the voice, suppression of the cough, the change from stridulous to sibilant breathing, and increased difficulty of respiration, all show death to be surely and speedily approaching. (West).

Treatment.— In my experience when the catarrhal stage is not arrested by *Aconite* or *Hepar*, or both, I give *Kali bich.* alone, or with *Aconite* if there is fever for several days. If spasmodic fits occur at night, *Spongia* is given. If the case grows no worse during its development but seems held in check, no change is made. I do not expect much loosening of the cough for three or four days. Then if the case increases in severity and no one remedy is clearly indicated (see *Brom.* and *Phos.*), Teste's advice to give *Bryonia* and *Ipecac* in alternation I have found serviceable. These cases are usually so clear that there is little difficulty in selecting the remedy, and it should be given persistently for days, for we are not treating a spasm to be relieved in a few hours, but an organic disease. Jahr talks most sensibly on this subject. He says:

"The treatment of membranous croup is not as difficult as is commonly supposed, provided we do not lose our presence of mind, and proceed coolly and with proper discretion.

"At the onset of the disease, if the child loses its cheerfuln shows symptom of fever, passes a urine that looks as if it had been stirred with flour, and utters the first characteristic sound of a barking, ringing cough, the danger is not yet very great, for we may yet have four or five, and even eight days before the really suffocative symptoms belonging to the period of exudation, set in.

"If, at this stage, we assail the little patient with big doses of *Spongia*, *Iodine* or *Brom.*, or even with these three remedies in alternation, in a purely empirical fashion, or with alternate doses of *Bryonia* and *Ipecac* as was done by a Paris Homœopathic physician by the advice of a clairvoyant, and nothing more is done than to give the medicines in increased quantities—if, in spite of this horrid medication, the suffocative symptoms set in nevertheless increasing in violence the longer this insane method is continued, there is indeed little chance of saving a patient thus abused; and I have seen more than one case where the child perished after this so-called Homœopathic treatment had been continued for a week, and the disease had been "*borne down upon with the most massive doses.*"

"In croup, likewise, success does not depend upon the quantity of heroic remedies but upon their quality, that is to say, upon their truly-specific relation to the case before us, and, as far as I am concerned, I do not see why those who only believe in the saving power of the most energetic remedies and doses, do not all at once pour a whole bottleful of smoking *Sulphuric acid* into their patient's throat; this would not only burn all the pseudo-membranes but a good deal more, and nobody could reproach them with not having acted with sufficient energy.

"In treating a case of croup, I generally proceed as follows: If I am sent for at the commencement of the attack, I give *Aconite* 30, three globules in a few spoonfuls of water, of which solution I give a teaspoonful every three hours until the fever and the croupy, ringing sound of the cough have disappeared, and it is evident from the resonance that the cough has assumed a catarrhal form. *Aconite* 3, ten drops in half a glass of water, a dose once an hour till perspiration sets in, to be followed by *Hepar*, has been my rule.

"But since experience has taught me that nothing is more insidious than the first or inflammatory stage of croup, and it often happens that, after the cough has almost entirely disappeared, and not a sign of fever is any longer perceptible, and the children play about on the floor and seem quite bright and cheerful, the disease sometimes breaks out again, all of a sudden in the dead of the night, with every symptom of exudation; I continue the *Aconite* even if the croupy sound of the cough has been removed, at longer intervals, until the cough is quite loose, and has been transformed into a loose mucous cough, or a free catarrhal discharge from the nose has made its appearance. In pursuing this course I have seen these two last-mentioned changes, with whose appearance every danger may be positively considered removed, set in on the second, third and fourth day, and in other cases, where I was not sent for at the commencement of the attack, only on the eighth day of the disease, without having had to use any other remedy than *Aconite* as long as the disease remained in its first stage and no suffocative symptoms had set in.

"If paroxysms of suffocation set in, but only at night, at long intervals, and the little patient remain tolerably cheerful in the daytime, I continue and adhere to the *Aconite* until no more suffocative paroxysms occur, and, if they cease, continuing the same medicine until the disease assumes a catarrhal form as previously described.

"If, in spite of the use of *Aconite* the suffocative paroxysms break out again, but chiefly at night, and we may infer from this fact, not that the exudative process is making full headway, and simply, as Hering very properly observes, that the mucous lining swells up evening and night in the form of nettle-rash, returning again to a more normal condition in the daytime, I give *Spongia* 30 in the same manner as I had given *Aconite*, more especially if the cough is dry and ringing, and the inspirations have a *crowing* sound, and continue the *Spongia* as long as it seems to have a good effect; but if it does not effect any improvement within twenty-four hours, and the cough has a rattling, sawing sound, I change to *Hepar*, which I administer in the same manner as *Spongia*, continuing it as long as it acts favorably.

"If *Hepar* does not improve the case I then give *Arsen.* [Jahr would have resorted to *Kali bich.* at this stage had he known its value], not only if the children had been affected with nettle-rash shortly before, but likewise if the weakness and anxiety during the paroxysms reach a very high degree; after giving *Arsen.*, the disease sometimes remains stationary, so that *Hepar*, *Bell.*, or *Phosph.* will now complete the cure. If the patient does not come under my treatment until the third stage has set in and exudation is under full headway, patches of false membrane are raised, the patient looks pallid as in death, and the face assumes a livid appearance during a coughing fit, I resort either to *Spongia*, *Hepar*, or *Kali bich.* according as the symptoms should indicate; and if neither of these remedies effects the least sign of improvement in twenty-four hours, I have recourse to *Phosph.*, which has produced splendid effects in my hands in this stage of croup.

"I cannot sufficiently warn against the use of large doses in this stage of the disease. Large doses, instead of promoting the cure by absorption, as our small doses generally do, cause most generally a detachment of the false membranes, which may not be a very bad result as long as the disease is confined to the larynx, trachea and the the larger bronchi, from which the detached patches can easily be expelled by cough.

"But if the finer bronchial ramifications are invaded, as we know from post-mortem examinations that they may be, the patient, even if the membranes are detached dies nevertheless in consequence of the stoppage of these delicate tubes by the detached membranes that cannot be coughed up.

"For this reason I never resort to *Arsen.* or *Bryonia* in this last stage of exudation, since these two remedies, when given in diphtheritis or pharyngeal croup, which is so nearly analogous to laryngeal croup, only effect a detachment of the pseudo-membranes, but not, like *Phos.* and *Apis*, their absorption.

"How rapidly the process of re-absorption goes on in these diseases, has been shown to me more than once in pharyngeal croup, provided I had given the right remedy, and it is for this reason that I do not despair of the good effects of *Phos.* even in the most extensive croupy exudation.

"As regards *Apis*, I have not yet had a chance to try it in croup; I would request my colleagues, if a case of croup comes to them in the third stage, never to omit a careful exploration of the chest, in order to ascertain how far the croupy exudation extends and to shape their prognosis in accordance with the results of their examination.

"If the more delicate bronchial ramifications are invaded and *Phos.* does not help in a few hours, the case is beyond our means of cure. Finally, if the croupy inflammation, in whatever stage it may be, has been changed to a simple catarrhal irritation, and the following remedies have not yet been made use of, I give for fluent coryza, *Merc.;* for dry cough, *Cham.*, *Bryonia*, *Aconite*, or *Ipecac;* for the hoarseness which sometimes remains for a long time, *Phos.*, *Hepar*, *Bell.*, or *Carbo veg.;* if the hollow cough returns, *Bell.* or *Spongia*, and for a long-lasting *mucous expectoration*, *Hepar* or *Phos.*

"In the case of children disposed to a return of croup, if the following remedies have not yet been used, I have obtained good effects from *Sulphur*, *Calc.*, and *Phos.*, giving each remedy at long intervals."

The special indications for the remedies are as follows:

Aconite.— Inflammatory period; high fever, dry skin, restlessness; the child is in agony, impatient, throws itself about; dry and short cough, but not yet wheezing, nor sawing respiration; cough and loud breathing during expiration, but not during inspiration; every expiration ending with a hoarse, hacking cough; after exposure to dry, cold winds.

Antimonium tart.—Voice weak and changed; hoarseness in the morning; rapid, short, heavy and anxious breathing; must be supported in a sitting posture in bed; large quantities of mucus in the bronchial tubes but no expectoration; tough secretion of mucus from air passages; oppressed breathing and sensitive stitches in the left chest; danger of suffocation from paralytic state of the lungs; face cold, bluish, covered with cold clammy perspiration; pulse very frequent; prostration; collapse; severe forms of catarrhal croup.

Arsenicum.— Cough worse after midnight; the croup aggravates by spells; between them, the child feels comparatively easy, though still distressed; great prostration; restlessness; thirst, but the child takes only a sip; bloated face, covered with cold perspiration; especially suitable to children frequently affected with hives and nettle-rash, where there is hoarseness; feeling of burning and dryness of the larynx; cough, with sense of constriction and suffocation. Cough worse after drinking. Great exhaustion; least effort exhausts the patient.

Belladonna.—Sawing, whistling breathing; frequent, barking, croupy cough, skin dry and hot; face red; eyes congested; pulse full, sharp and frequent; tonsils red and swollen; patches of membrane on the fauces; great restlessness and irritability. The cough is hoarse, causing the face to flush.

Bryonia.—Tough mucus in the trachea, which is loosened only after frequent hawking; scraping sensation in the lower portion of the trachea, provoking a dry cough; voice rough and hoarse; hacking, dry cough, from the upper part of the trachea; single, forcible, spasmodic shocks towards the upper part of the trachea, which is covered by dry, tough mucus; cough, from a constant crawling upward in the throat, followed by expectoration of mucus. It works well after or with *Ipecac.*

Bromine.—Children with blue eyes and light hair. Spasmodic or suffocative croup; hoarse, whistling, croupy voice, gasping for breath; much dry, wheezing cough without expectoration; formation of a false membrane in larynx and trachea; much rattling in the larynx when coughing, and hoarseness and spasmodic closure of the glottis.

Causticum.—Catarrhal croup; sensation of rawness in the throat when coughing, with sawing respiration; dry sensation in the air passages; irritation to cough, with easy expiration; dry, hollow cough with sore sensation in a streak down along the trachea, where it pains on every fit of coughing and almost prevents breathing; frequent attacks of suffocation during inspiration, as if some one grasped the trachea, arresting the breathing for the moment.

Cubebæ.—False membranes thick and of dark shade, principally in the larynx; respiration noisy and panting; sensation as if the head was choked up, with heaviness of head, danger of suffocation; voice harsh and wheezing; cough with coryza and hoarseness; during and after the cough cold sweat upon the chest and back with burning in the abdomen; respiration impeded, difficult, with crepitant rales; great fullness of chest; dyspnœa and sense of suffocation, barking and croupy cough, with feeling as of a foreign body in the lary throat dry and parched; respiration hurried and noisy; face red and pale by turns; contractive and pressive headache with drowsiness, but without sleep; uneasiness, anxiety, cannot remain in bed; constant need to swallow the saliva to relieve the dryness and suffering in the throat and larynx.

Hepar.— Croup after exposure to dry, cold wind, with swelling below the larynx; great sensitiveness to cold air; red face, high fever, hoarseness and rattling of moist mucus, which the child is unable to get rid of, but still little or no difficulty in breathing; aggravation after midnight or towards morning; sensation as if there was a fishbone in the throat, or of internal swelling when swallowing; stitching pain from ear to ear when swallowing or turning the head. The child chokes with every coughing spell.

Iodine.— Black-eyed children; roughness, painful pressure and stitches in larynx and pharynx, as if swollen; pain in larynx, with discharge of hardened mucus; constriction and heat in the larynx; increased secretion of mucus in the trachea; dry, short and hacking cough; soreness of the throat and chest, especially when in bed, with wheezing pain in the throat and drawing pains in the lungs (the child grasps throat and chest with his hands); hoarseness, the voice becoming continually ,deeper; tracheal and bronchial croup, with tendency to torpor; moist cough with expectoration; morning aggravation; expectoration of large quantities of mucus, frequently blood streaked; constant desire to change position, without anguish. Plastic exudation. Coldness in the face of very fleshy children. Voice has a deep, hoarse, rough sound.

Ipecac.— Catarrhal croup, convulsive evening cough; expectoration of mucus, with metallic taste; spasmodic cough, with constriction and danger of suffocation; shocks on falling asleep; rigidity of the body, followed by jerking of the arms towards each other; nausea and vomiting.

Kali bich.— It suits best fat, chubby children; gradual and insidious onset; at first only slight difficulty of breathing when the mouth is closed; as the disease progresses there is fever and increased difficulty of breathing, hoarse voice, constant cough at intervals; cough hoarse, dry, barking metallic; deglutition painful, tonsils and larynx red, swollen, covered with a false membrane, difficult to detach, with expectoration of tough stringy mucus; finally breathing performed only by the abdominal muscles and those of the neck and shoulders; head bent backwards; breath offensive, diminished temperature, prostration, stupor and death from asphyxia if not relieved. The air sounds as though it was passing through a metallic tube.

Kaolin.— Croup seated in lower part of larynx and upper part of trachea; husky voice; metallic rasping cough; paroxysms of suffocation. The child is very hoarse and breathes with difficulty.

Lachesis.— Croup in children subject to inflammatory rheumatism; decided aggravation after sleep, after a short nap; the children as it were, sleep into the croup, and, when thoroughly aroused breathed more freely; the child cannot bear anything touching the neck; patches of exudation in the fauces, extending downwards on pharynx and larynx; commencing paralysis of lungs; left side of throat particularly affected; sensation as if there was something fluttering above the larynx; cough excited by sensation as if a crumb of bread were sticking in the throat, causing frequent hawking and swallowing. Arouses with a paroxysm of choking. Almost loses its breath and is sometimes convulsed.

Lactic acid.— Dryness, scratching and burning in the throat; tearing in larynx and trachea with hoarseness; difficult expectoration of gray, tasteless mucus, or so tough that air can hardly pass through it; croup sound not heard.

Lycopodium.— Hoarseness remaining after croup or with it loose cough in daytime and suffocative fits at night, or, in general, or when suffocative fits alternate with free catarrh; dryness in wind pipe with hoarseness; feeling of rawness in the trachea with increased expectoration of mucus; cough in the evening before going to sleep as if the larynx were tickled with a feather, with scanty expectoration; tickling cough; gray, salty expectoration and difficult respiration.

Phosphorus.— Catarrhal and inflammatory state; painfulness of larynx to touch; hoarseness and aphonia; shortness of breath; the child is hoarse and croupy at night; better towards morning; croup with tendency to relapse, especially in tall slender, nervous children. When hoarseness remains after croup and when there is a tendency to relapse.

Sanguinaria.— Pseudo-membranous croup; chronic dryness of the throat with expectoration of thick mucus; aphonia with swelling of the throat; steady severe cough without expectoration, with pain in the head and circumscribed redness of the cheeks; tormenting, exhausting cough.

Spongia.— Children with fair complexion; great dryness of the larynx, with short, hard, barking cough; embarrassed breathing, as if the larynx and trachea became narrower; pain in the larynx when touching it; slow, loud wheezing, and sawing breathing, and suffocative fits with inability to breathe, except with the head bent backwards; sawing sound during remission; the child wakes with suffocation about the larynx on falling asleep early at night; always worse before midnight and croup does not extend below the larynx.

Tracheotomy.—The following method of performing this operation is well described by Surgeon GILCHRIST.

"Tracheotomy for croup, or similar morbid action, is a somewhat different operation in detail from that performed for other purposes, as the extraction of foreign bodies and the like.

"The first question to be decided, and one of some difficulty, is whether there be toxæmia to a degree sufficient to prejudice the success of an operation, as well as whether the morbid action has invaded the trachea or bronchia. Under either circumstances tracheotomy should not be attempted; it may hasten a fatal termination. As Erichsen says, speaking of operations in general, 'in giving a patient a last chance' for his life 'we often take from him all that he had.' The circumstances demanding it, and the promise of success good, proceed as follows: Provide an ordinary scalpel, medium size, a tenaculum, a director, artery forceps, ligatures, plenty of sponges, hot water, and two hairpins bent into a double hook. It will be necessary, also, to have a piece of fine gauze or cambric, soft and unsized or starched. Usually the child will be more or less unconscious, at all events the sensibilities will be dulled; profound anæsthesia will not be called for, and if possible it had better be dispensed withal together. Pin a strong towel around the child, confining the arms securely to the side, and have it held in the lap of an assistant, the head will naturally be thrown back, fully exposing the neck. The line of the incision in the integument had better be marked out before beginning, and as ink or pencil marks are readily washed out or obliterated by the blood, lunar caustic had better be used. The line should extend from the lower border of the thyroid cartilage, downward for three inches or more, pinch up a fold of the integument, between the finger and thumb of the left hand, and enter the curved bistoury on the line for the incision as low down as possible. Push it upwards until the point emerges, likewise in the line previously marked, as high up as possible. Rapidly incise the fold thus transfixed. Inserting the director in the wound enlarge the incision upwards as far as is desired to go, then carefully sponge the wound, and proceed no farther until all hæmorrhage ceases. When the bleeding has stopped, with the handle of the scalpel, gently separate the muscles, break through the areolar tissue met with in this region, and push the veins to one side, or out of the way. If the isthmus of the thyroid gland is in the way, it may be divided, but it is better to avoid this if possible. The larynx is now reached and will be found to be in violent motion, 'pumping' up and down. If any arterial twigs spring, secure them by torsion, likewise the veins, if any are wounded and bleeding does not soon cease, the trachea being laid bare, suspend all further procedures until the hæmorrhage has completely ceased, and the wound is dry. The next step, is to open the trachea. This demands coolness, firmness and promptitude. Directing an assistant to hold the lips of the wound asunder by means of the handles of two teaspoons, take the tenaculum in the left hand, and the scalpel in the right. Hold the scalpel by the blade, the edge directed upward, and not more than a quarter of an inch from the point exposed. Watching for an opportunity when the larynx *rises*, with a single firm and rapid motion, hook the tenaculum in the intercartilaginous substance, and immediately insert the point of the scalpel into a similar space two or three rings below that transfixed by the hook. Rapidly cut upwards (never in the opposite direction) dividing two or three rings, throwing the knife away, keeping the tenaculum still in position, insert the bent hairpins, hooking them by the bent extremity one in each side of the wound, the assistant applying that on the left side. Withdraw the tenaculum quickly to avoid lacerating the parts—the handle of the teaspoon to be likewise withdrawn—and secure the hairpin hooks by tapes passing around the back of the neck. The breathing will instantly improve, and the expression of the little patient will be correspondingly better. Now wet the cambric in warm water and apply it over the opening. This must be kept moist as it supplies extra moisture to the inspired air, and prevents the admission of irritating floating substances.

"The wound should be kept open until it is evident that there is no extension into the larynx, and the morbid action is abating in violence. As soon as this is evident, the hooks should be withdrawn, and the wound closed by a circular bandage of the neck. When the wound in the trachea has closed, that in the integument may be drawn together by adhesive strips. It has occasionally happened that a too early closing the integumentary wound has favored the formation of an aerial fistula by imperfect closure of the tracheal wound, for this reason leave the wound in the skin alone, until that in the trachea has closed. The opening in the trachea will rarely require to be kept open longer than twenty-four, or at most forty-eight hours. No tubes should be used, they are often productive of mischief.

"If the operation is not a purely improvised one, in place of the hairpin hooks, two flat nickel-plated hooks may be made with an eye to one end for the attachment of the retaining tapes.

"The subsequent treatment will depend upon circumstances. Ordinarily *Aconite* will be all that is required. *Rumex* has been found useful when the entrance of air into the trachea caused spasmodic coughing. When torsion has been applied to bleeding vessels, and no ligatures left in the wound, there will be no difficulty in closing the wound. Under other circumstances *Calendula* will be needed to hasten repair.

"The accidents that may occur are few and unimportant, in competent or careful hands. Hæmorrhage takes the first rank, but need seldom occur if the isthmus of the gland is not divided, and the tissues are separated entirely with the fingers or handle of the scalpel. Nearly all the veins, nerves, and other important structures are easily held out of the way, and the occasion must be rather infrequent for their division. Entrance of blood into the larynx should never occur; the tracheal rings should not be op ened until all hæmorrhage has ceased. The trachea, however, will speedily relieve itself of coagula or such intruders, and no alarm need be felt.

"The operation *per se* is not a difficult one, sufficient anatomical knowledge will render it easy. It is only in the case of those deficient in anatomical knowledge, or who have not the requisite quickness and firmness in manipulation, that there are any special difficulties. The results, however, are not sufficiently flattering to recommend its frequent performance. The almost universal fatality attending upon such cases, is no doubt greatly due to the toxæmia and not strictly to the operation. Still lives have been saved, and as long as the lungs are not seriously affected, the swollen bronchia invaded by the exudation, or the blood loaded with carbonic acid gas, it is justifiable, supposing all possible means for relief have been instituted, and death seems imminent. Unquestionably many cases of failures are due to delay, but remedies given upon Homœopathic indications are so generally curative, that conviction of failure ordinarily comes too late for any hope of benefit from tracheotomy. The mortality may be put as high, I think, as 80 per cent."

SPASM OF THE GLOTTIS. LARYNGISMUS STRIDULOUS. CHILD CROWING. "INWARD FITS." THYMIC ASTHMA. ASTHMA KOPPII.

This disease strictly belongs to the class of neuroses, but is introduced here because it has been mistaken for croup. It is characterized by crowing inspirations or by momentary suspensions of the act of respiration; these attacks occur suddenly, and at irregular intervals, are of short duration, cease suddenly, and are unaccompanied by cough or other signs of irritation of the larynx. If the disease progress, it becomes associated with other convulsive symptoms, as strabismus, distortion of the face, carpo-pedal spasms, or general convulsions. (Meigs & Pepper).

This affection belongs almost exclusively to infancy, although I have met it in children ten years of age, and is due to the narrowness and delicacy of the chink of the glottis, and to the extreme irritability of the nervous system during infancy.

That the glottis may become spasmodically contracted is no longer any subject of doubt. This may be demonstrated experimentally by vivesections, and is anatomically confirmed by the insertions of the muscles of the larynx. An acute and chronic form may be distinguished. There are spasms of the glottis in which death ensues, after the first few paroxysms by choking or suffocation, and others again which last for months and may relapse after very long pauses.

Etiology.—Spasm of the glottis, says Dr. Marshall Hall, is an excitation of the true spinal or excito-motory system and originates in

I. (*a*). The *trifacial*, in teething. (*b*). The *pneumo-gastric*, in over- or improperly-fed infants. (*c*). The *spinal centres*, in constipation, intestinal disorder or catharsis.

These act through the medium of II. The spinal marrow, and III. (*a*). The *inferior* or *recurrent laryngeal*, the constrictor of the larynx. (*b*). The *intercostals and diaphragmatic*, the motors of respiration.

The defective nutrition which shows itself in the bowed limbs, and distorted form of the rickety patient, is attended in early life by special proneness to convulsions, and so intimate is the relation between rickets on the one hand, and convulsion and spasm of the glottis on the other, that Dr. Gee dates as the result of careful observations among the out patients at the Children's Hospital, that forty-eight out of fifty cases of spasm of the glottis presented evidence of rickets. (West).

The partial recognition of the important part played by rickets, (*i. e.* glandular derangement) in predisposing both to convulsions and laryngeal spasm has led to various theories of its origin. Thus Kopp ascribed it to the assumed pressure of an enlarged thymus gland, and Ley that it was due to a possible pressure of enlarged cervical glands upon the recurrent laryngeal nerve, while another writer struck by the connection of spasm of the glottis with enlargement of the liver (fatty liver) supposed it to depend upon an impediment to the descent of the diaphragm occasioned by the great size of the liver. It is unnecessary to remark that these theories have been refuted.

In addition to the general causes, that predispose to the disease, there are others which give rise to or favor the single paroxysms. Fright is one of these; a loud, suddenly produced noise may suffice to induce a spasm of the glottis. It may also be produced, by depressing in the examination of the mouth, by the acts of deglutition, by coughing and by crying. But the closure of the glottis brought about by crying should be carefully distinguished from that cataleptic state into which every choleric infant and some older children, from two to four yeas of age, are voluntarily able to work themselves. There are very many, chiefly badly brought up spoiled children, who at the slightest provocation throw themselves into violent paroxysms of crying, and exert themselves so forcibly that they are for a moment unable to draw their breath, and for an instant become livid or even bluish-red in the face, and then begin their cry anew with a whistling prolonged inspiration. This kind of voluntary unconsciousness is by no means dangerous, and there is no reason at all why the will of such children should be humored in order to avoid this condition. The most rapid psychological (not to say physical) method of treating this, is to dash a glassful of cold water into the face.

Disturbances of the digestion may likewise produce spasms of the glottis as may be readily inferred from the fact that a sensible regulation of the diet and abstaining from nutriments difficult to be digested bring about a speedy improvement; while all treatment is fruitless so long as the digestion is attended by flatulence or diarrhœa or other disorder. Children at the breast are rarely affected by this disease; and of the artificially-fed children, mainly those who do not properly digest the immoderate quantities of food allowed them are the sufferers.

In most cases the disease runs through a certain circuit, in which an aggravation, a climax, and a diminution can be recognized. At first the attacks are rare recurring every eight or fourteen days, but in the process of time they become more frequent, finally occur several times daily, and increase i intensity. Before this climax has been reached, six to eight weeks generally pass away. The children either perish in a fit, or, when this acme has lasted for from eight to fourteen days, are attacked by fever and become emaciated. A lobular pneumonia or a profuse intestinal catarrh may come on and result in death. (Vogel).

Symptoms.—This disorder almost always comes on by degrees, and children attacked by it are more or less anæmic, or have been drooping for some time, with loss of appetite, and may be fretful or restless. At length a slight crowing sound is occasionally heard with the child's respiration. The sound is something between the hoop of hooping cough and the stridor of true croup, and is usually noticed when the child first awakes from sleep, but is sometimes perceived during a fit of crying or when the infant is sucking. Now and then the first crow is very loud, and by its resemblance to the sound of croup at once alarms the attendants; but this is not generally the case; and its loudness usually increases as the return becomes more frequent. Throughout the whole course of the affection its attacks will be found to be more frequent by night than by day, and to occur mostly either soon after the child has lain down to sleep, or towards midnight, when the first sound sleep is drawing to a close. The attacks become more severe and then fits of difficult breathing come on in which the child throws its head back, the face becomes red or reddish-blue with a marked ring of ashy paleness around the lips slight convulsive movements pass over the muscles of the face, the chest is motionless and suffocation is impending. But in a few seconds the spasm yields, expiration is effected, and a long, loud, crowing inspiration succeeds or the child begins to cry. Breathing now goes on naturally; the crowing is not repeated, or the crying ceases. A few hours or even a few days may pass before its recurrence and, to the foregoing a symptom is superadded, if it has not, as is often the case existed from the very beginning. This is a peculiar contraction of the hands and feet. It differs much in degree; sometimes the thumb is drawn into the palm by the action of its abductor muscles, while the fingers are unaffected; at other times, the fingers are closed more or less firmly and the thumb is shut into the palm; or coupled with this, the hand itself is forcibly flexed on the wrist. In the slightest degree of affection of the foot, the great toe is drawn a little away from the other toes; in severer degrees this abduction of the great toe is very considerable, and the whole foot is forcibly bent on the ankle and its sole directed a little inwards. Coupled with these carpo-pedal contractions the back of the hand and the instep are swollen, tense and livid and occasionally there is slight puffiness about the face. This swelling may be due merely to the impediment to the circulation presented by the continuous spasm and subsides of its own accord as the spasm abates. When the disease has reached a high degree of intensity, a slight, crowing sound often attends each inspiration, and the paroxysms of difficult breathing are much more severe; they last longer, and sometimes terminate in general convulsions. The disease is apyretic in a large majority of cases. When fever arises it almost always depends on the condition which has occasioned the disordered action of the excito-motory system, or on some accidental complication.

Death may occur very early in the disease, or after weeks, or even months; on the other hand Vogel states that "sometimes even the very first attack terminates in death, and a seemingly perfectly healthy child may be carried off in a few seconds."

Prognosis.—The prognosis of laryngismus stridulus is always serious since the mildest cases may terminate fatally in any one of the paroxysms, but it is far from being so dangerous a disease as has been supposed. When it depends on dentition, improper diet, or gastro-intestinal disease, the case will in all probability terminate favorably, if the proper treatment can be and is brought to bear against these morbid conditions. Usually the prognosis depends upon the frequency and intensity of the attacks, upon the complication and upon the comparative development of the child. Children at the breast recover more often than thin, emaciated children inclined to atrophy.

Therapeutics.—Jahr recommends *Aconite*, *Bell.*, *Cuprum*, *Ipecac* and *Veratrum alb* In Hartman's opinion *Arsenicum* 30 is of prime importance. *Cuprum* has proved curative in the cases I have met. Drysdale found *Arsenicum* and *Lachesis* most useful.

Aconite.—When a suffocating cough comes on at night, with shrillness and hoarseness of voice; respiration short, anxious and difficult, more particularly if any marked febrile symptoms be present, or there is reason to dread determination of blood to the head.

Arsenic.—The attack is preceded for several days by catarrhal symptoms. The little patient goes to sleep quietly and the spasm develops itself gradually; respiration short and hissing, when the spasm sets in with sudden suffocation; great anguish, cold perspiration, and considerable prostration of strength during and after the paroxysm, with aggravation between midnight and daylight.

Belladonna.—This is indicated by the characteristic spasm in the larynx, and may be given to children of every variety of constitution, plethoric or lymphatic (scrofulous), rickety, etc., and more particularly when bad management has induced collateral complications or cerebral affections.

Cuprum.—Convulsions with blue face and blue lips; short, panting whistling breathing; the attacks come on suddenly and cease suddenly after fright of mother or child; cold perspiration at night, cough relieved by a swallow of cold water. This remedy is frequently indicated.

Chlorine.—Spasmodic affection. Suddenly and without warning the little patient takes a long inspiration with a slight crowing noise, but he cannot make the expiration; blueness around the mouth, partial unconsciousness followed by free respiration and deep sleep. The attacks may come on after excitement, during sleep, and most common from midnight till seven A. M.

Gelsemium.—Inspiration long with croupy sound, expiration sudden and forcible. Sudden and severe attacks of dyspnœa, with crowing noise, profuse perspiration and darkly flushed face.

Iodium.—Rachitic children, swelling of bronchial glands; tightness and constriction about the larynx, soreness, hoarse voice, etc., enlarged glands may even cause paralysis of the laryngeal and bronchial nerves.

Ipecac.—When there is rattling in the chest from an accumulation of mucus, with spasmodic constriction, and symptoms as from suffocation; anxious, short and sighing respiration, with purple color of the face and cramps or rigidity of the body.

Laurocerasus.—When the child is pale and blue, spasmodic constriction of the throat and congestion of the chest.

Moschus.—Frequently of value in cases that occur at a more advanced period of life when there is constriction of the larynx as if caused by the vapor of *Sulphur*; difficult respiration and short breathing; severe spasms in the chest, with inclination to cough, after which the paroxysms are much aggravated.

Nux vomica.—Reflected irritation from derangement of the digestive organs.

Phosphorus.—May be called for in some cases of tall spare children with pneumonic complications.

Sambucus.—The children wake suddenly from a sort of half slumber with the eyes and mouth open, they raise themselves on their seats with anxiety dyspnœa, wheezing in the chest, as if they would suffocate, they strike about with their hands; head and hands are bloated bluish; they are very hot and dry, but not thirsty. Before the paroxysm sets in the child cries; there is no cough; the attack occurs principally from twelve to four o'clock; suppressed perspiration; small, irregular and intermittent pulse; burning red, hot face, with cold hands and feet during sleep. On awaking the face breaks out into a profuse perspiration, which extends over the body, and continues more or less during the waking hours; on going to sleep again, the dry heat returned. Difficulty of inspiration but not of expiration.

Stramonium.—If the child seems quite delirious, does not know where it is; as soon as it can speak it constantly calls for papa and mama, although they may be at the same time present and trying to console the child.

In chronic cases such as may be supposed to arise from enlargement of the cervical or bronchial glands, study *Calcarea c.*, *Iodide of Mercury*, and *Spongia*. (See Tuberculosis.)

PARALYSIS OF THE GLOTTIS. APHONIA PARALYTICA.

There are really two forms of this disease, the mild catarrhal form due to cold, aphonia; and the severe paralytic form. If we are to depend on present statistics, paralysis of the glottis would seem to be uncommon in childhood, but it may be assumed that as we acquire a more certain knowledge of the lesion, the frequency of its occurrence will be more noticed.

Its *symptoms* consist of a group affecting the voice as hoarseness or complete loss of voice, and another affecting respiration, and consisting of obstructed breathing with obstinate and sometimes even convulsive attacks of coughing, accompanied by a peculiar shrill, brassy sound which has a remote resemblance to the sound heard in croup. The disease has generally a very chronic course, though sometimes it may be acute, and this is determined by the nature of its exciting cause. Sometimes there are intermissions when the voice is clear and sonorous, due to some powerful mental or some external influence. After the paralysis has lasted some time there results fatty degeneration and atrophy of the affected muscles which may be any of those in the larynx, all being supplied by the superior and inferior or recurrent laryngeal branches of the vagus. If a laryngoscopic examination be made, the larynx is found normal, but there is deficient and assymmetrical movement of the cords, the unequal tension of which produces the hoarseness. The affection is usually unaccompanied by any pyrexial symptoms.

The following varieties of the glottic paralysis may be classed according to the causes of their production :

1. That produced by lesion of the central nervous system, in such diseases as hydrocephalus, tubercular meningitis and tumors, which, contracting the space occupied by the brain substance produce pressure on the recurrent fibres.

2. That due to peripheral causes, as pressure by enlarged or tubercular glands in the neck on the vagus nerve, or its recurrent branch.

3. That which is the result of local catarrhal or inflammatory

affection in the larynx, and to this variety there belong the cases of paralysis of the cords after laryngeal catarrh, diphtheria, and those due according to Gerhardt, to idiopathic affection of the muscles.

4. A reflex variety due to the disturbances of puberty, and according to some authors, sometimes to the irritation of worms. Steiner has seen two cases of girls between eleven and twelve years of age, intermittent aphonia last until the occurronce of the menses, for eighteen months in one case, and twenty in the other. This affection is, of course, more common in girls than in boys, and generally occurs between the tenth and fourteenth years of life.

Diagnosis.— This may be established with certainty by laryngoscopic examination, if it can be made; when this is impossible the intermittent character of the aphonia, the presence of some probable cause for it, such as large scrofulous glands in the neck, together with the previous occurrence of an attack of diphtheria within a recent period, and the obliquity of the epiglottis, will reveal the nature of the affection. An accurate diagnosis between this disease and chronic catarrh, or a tumor of the larynx can, however, be made only by means of the laryngoscope. (Steiner.)

Treatment.—Cases occurring as a sequelæ of diphtheria have been cured by *Gelsemium*. Other remedies as *Arnica*, *Arsenicum*, *Baryta*, *Belladonna*, *Causticum*, *Cocculus*, *Cuprum*, *Plumbum*, *Rhus*, *Stannum*, *Sulph.*, *Thuja* or *Zincum* may be needed. While such deep-reaching remedies as *Aconite*, *Dulcamara*, *Hepar*, *Hyoscyamus*, *Hydrocyanic acid*, *Lachesis*, *Muriatic acid*, *Opium*, or *Stramonium*. *Tabacum*, may occasionally be indicated. If the lungs are prominently affected, and suffocation threatens, *Tart. em.*, *Camphor*, or *Musk* promise help.

TUMORS OF THE LARYNX.

Hoarseness supposed to be attacks of croup are sometimes due to tumors in the larynx. These are seldom met with in childhood, and among the cases that have been noticed, papillomatous growths take the most prominent position as being almost exclusive of all other kinds. (Steiner.)

Prof. C. Adams read a paper on *Tumors of the Larynx* before the Chicago Academy of Homœopathic Physicians and Surgeons, and it was kindly placed in our hands by vote of the Academy and the courtesy of Prof. Adams, who has given this subject special study.

Laryngeal neoplasms are of less frequent occurrence in children than in adults. They, however, include the same varieties (cancer excepted) and are discovered by the same or nearly the same symptoms. The frequent occurrence in childhood of diseases in which dyspnœa is a principle symptom, as croup, etc., leads quite often, we believe, to this form of trouble being overlooked, but a careful observance of some leading conditions should enable the practitioner to differentiate in the diagnosis of these and other lesions of the larynx.

As regards the nature of the growths, the records of cases already published show that about two-thirds of the entire number have been papillomatous or fibroma papillare, about a tenth pure fibromata, the remainder including myomata, adenomata, and cystomata in smaller proportions. The seat and form of the growth may have important bearings on the development of symptoms, thus, a growth not directly in connection with the vocal cords may if sessile attain a considerable size before interfering with the voice, while a growth of small size on the cords may produce complete aphonia. Occasional dyspnœa or dysphonia may be produced by a pedunculated growth becoming temporarily engaged in the vocal cords, or, sudden intensity of symptoms may occur from nearly complete obstruction of the windpipe by the development of a growth beneath the cords. In the cases of papilloma in adults, we find that over-exertions of the voice in shouting, singing, etc., acts as a powerful predisponent, the order of conditions being hyperæmia, catarrh, hypertrophy of vascular papillæ. In children these growths seem in a majority of cases, to follow any of the diseases of childhood which leave the larynx in a hyperæmic condition, as croup, diphtheria, measles, hooping cough, while it has been already shown that many of these recorded cases are purely congenital. Regarding the congenital nature of polyp of the larynx we may say that Causit is the only author who has placed the subject in as strong light as it deserves. Mackenzie, (Essay, on Growths in the Larynx, London 1871) says:

"The congenital origin of these growths, though very probable, cannot, however, be said to have been established, because, in the fatal cases which have been brought forward in support of this view, the patients did not die until they were a year or two old; and where a laryngoscopic examination has verified the existence of a growth, the little patient has always attained the age of three years or more. It is very probable that cases of congenital neoplasm in the larynx do occur, but there is not a single case on record where a still-born child has been found to have a laryngeal growth, nor has such a growth been found to exist within the first month or two of infant life."

Perhaps the comparative rarity of examinations of the vocal apparatus of new-born children may account for the absence of statistics but Mackenzie in his table gives notes of several cases which are headed *congenital*. Dr. Cohen in the last edition of his work (1879) says, regarding laryngeal neoplasms: "Some are congenital, others are developed in advanced life. My own experience includes cases apparently congenital."

Lennox Browne (Diseases of the Throat, 1878.) says these growths "may even be congenital." Von Ziemssen (Cyclopædia of Medicine, Vol. VII, Article, Larynx) says, "the period of early childhood was formerly regarded as possessing considerable immunity. On the other hand Causit claims the specially frequent occurrence of laryngeal polypi during the first years of life and even congenitally."

Durham (Holmes System of Surgery) says: "One case has come under my observation in which it was evident that the growth had commenced before or immediately after birth."

Causit (*Etude sur les Polypes des Larynx*, Paris, 1867) beside collecting particulars of over forty cases in childhood, has given a detailed account of many cases of unmistakably congenital origin, and pointed out one or two important signs for their recognition.

From the foregoing it will be seen that, save Causit, none of the authorities quoted gives more than a slight allusion to the occasionally congenital origin of laryngeal polypi, and still less consideration to the matter of their diagnosis.

We consider all cases in which the symptoms have been persistent from birth, as fairly coming under the head of congenital, while those following the diseases already mentioned may be classed as acquired. We have no light on the question of causation in the congenital forms; in the acquired, undoubtedly the catarrhal condition of the larynx is the principle factor. The symptoms most characteristic are the disturbance of function as indicated by the character of the voice and respiration. A careful review of fifty cases in children shows that in every instance there has been more or less aphonia. In many of them it has been complete, or varied only by *an occasional utterance in a shrill tone*, while in others it has been of an intermittent character. Mackenzie (Op. cit.) refers to "a kind of dysphonia, which, when present, is very characteristic of growth cases. The patient whilst speaking in his natural voice, or in a slight hoarse or croupy tone suddenly becomes completely aphonic, and again, after a minute or two, recovers his hoarse or natural voice."

The character of the respiration has been observed to be changed in about one-half the cases before mentioned. In these the respiration during the intervals between paroxysms of dyspnœa has been noisy and jerky. Mucous rales over the larynx have been noted in some cases, while in others the sounds have been described as flapping (*bruit de drapeau*), gurgling and explosive, like cork drawing. As the cases progress the intervals between paroxysms of dyspnœa become shortened and the attacks themselves increase in intensity. Attacks of croupal respiration may be precipitated by exposure, overexertion, or change of position, their severity varying with the size and situation of the growth. Cough has not been noticed in a sufficient number of cases to constitute a symptom of value. When observed it has been croupal or from temporary embarrassment of respiration, by a mobile tumor, paroxysmal. Difficulty of swallowing as in adults does not show itself unless the tumor be attached to the epiglottis or of such size as to project into the pharynx.

Pain in children cannot of course be precisely estimated, and as it is not a constant or even frequent sign in adults, may be left out of consideration.

Before proceeding to the consideration of the *physical* signs, we may place under two heads the cases which call for an examination by the laryngoscope.

1. All cases in which from birth, or a period soon following, there are: Embarrassed respiration, persistent hoarseness, aphonia, complete or varied by occasional accessions of a high shrill voice.
2. Those cases in which any of the symptoms above enumerated occur after croup, hooping cough, diphtheria, or the exanthemata in early childhood.

The necessity for an early recognition or the exact nature of the affection is manifest in a glance at the tables of Causit, Mackenzie, Fauvel, and others, for in most of them, from the lack of knowledge as to the seat and extent of the neoplasm no remedial measures were adopted until repeated attacks of dyspnœa had exhausted the patient. Under such circumstances tracheotomy having been resorted to as a measure without alternative, although the operation has been prompt to relieve the distressing symptoms, in numerous cases the child has perished from sheer lack of recuperative power. An early appreciation of the exact condition of the larynx may enable the surgeon to adopt other methods of operative treatment than tracheotomy, while it is quite obvious that treatment by medicine, to be effective must be given during the early history of the tumor.

The examination of the larynx in childhood is a procedure of some difficulty, but with patience, skill and the confidence of the patient may be accomplished even in cases of very young children. When necessary an anæsthetic might be employed.

If a laryngoscopic image *can* be obtained, the diagnosis may be clearly made and such measures adopted as best suit the case. Digital exploration by means of the index finger is of no practical value in children. The sounds heard on auscultation have already been noted. A diagnosis has been made in several cases by the results of microscopical examination of expectorated particles.

Should the laryngoscopic or other examination reveal the existence of a growth, a choice of treatment may be open to the practitioner. If the neoplasm be of small size and the papillomatous variety, the patient not being in danger of suffocation, remedies may be given, and for this purpose we should suggest the trial of *Alumina*, *Causticum Calcarea*. *Thuja*, [*Calc. phos.* or *Sanguinaria* might be as serviceable here as in polypi of the nose.]

If the patient be of sufficient growth to submit of manipulations through the mouth, local applications of *Acetic acid*, *Nitrate of Silver*, etc., may be made directly to the growth. This method has been eminently successful in a number of cases, but of course can only be employed by an expert laryngoscopist. Removal of the growths directly by suitable forceps can be accomplished with the aid of the laryngeal mirror. The tube forceps of Mackenzie, or the antero-posterior forceps of Fauvel will be found the best instruments for the procedure. The galvano-cautery has been used, but it must be borne in mind that the larynx is exceedingly intolerant of burns, and much risk is run of damaging the vocal cords by contact with the heated wire.

The greatest difficulty will be found, however, in dealing with these growths in the cases of children too young to undergo any sort of operation through the mouth. In such cases the existence of a growth being satisfactorily demonstrated by such symptoms as have been pointed out, and examination, unless the growth is amenable to treatment by remedies, the indication is to perform tracheotomy, the patient to wear the tube until the removal may be accomplished through the natural passages or by thyrotomy.

Too much stress can not be laid upon the injunction to operate early. The attendant must not loose sight of the fact that tracheotomy averts risk of death by *suffocation*, and in itself, is an operation of slight gravity when properly done. On the other hand, study of recorded cases shows that if the operation be postponed until after repeated attacks of dyspnœa have exhausted the ability of the patient to withstand the operative interference, it is only rarely successful. An early tracheotomy puts the case under control of the surgeon, who can subsequently adopt such measures as the age of the child or development of the growth may demand.

DISEASES OF THE TRACHEA.

Diseases of the trachea are seldom primarily confined to this part of the air passages, but more usually form part of a general catarrhal or inflammatory affection of the respiratory mucous membrane, as in catarrh, croup and diphtheria. The symptoms are similar to those of the general affection, and have no indications for special treatment. Sometimes there are seen cases of specific affections of the trachea in children affected by syphilis. This takes the form of superficial or deep ulceration with destruction of some of the rings, and subsequent diminution of the calibre of the tube.

Polypi of the tracheal mucous membrane are sometimes met with, producing the ordinary symptoms of obstruction. Sudden suffocation has occurred in these cases by impaction of the polypi between the vocal chords. (See Tumors).

Thinning, ulceration, and complete perforation of the tube of the trachea, to a greater or less extent, may be the result of pressure of hyperplastic, inflamed or tubercular glands in the neck, the seat of these alterations being usually the posterior or lateral walls; with reference to this accident it may be mentioned that obstruction of the larynx or of a bronchus or fatal pneumonia has been met with as the result of the drawing into the trachea of fragments of these glands. (Steiner).

The treatment will need to be adapted to the case and cause. If syphilitic, *Nitric acid*, or *Merc.* or *Kali* will be indicated. For the management of polypi, see Tumors of the Larynx. *Sanguinaria* or *Calc. phos.* See Chronic Laryngitis and Bronchitis.

DISEASES OF THE LUNGS.

Development and Congenital Malformations.—The thorax at first is but a very narrow cavity, the walls are very thin, consisting of nothing more than a flexible pellicle, in the centre of which appear some semi-circular white lines, which afterwards form the ribs. In proportion as the child advances in age, and the lungs are developed, the thorax becomes more spacious, its cavity is developed, more especially at the lower part, for at first the abdomen forms almost the whole of the trunk of the embryo; and upon its superior and lateral walls are seen two small, round, and slightly projecting eminences constituting the rudiments of the arms. The two sides of the thorax do not approach each other, to complete the thoracic cavity, for the thorax is always closed unless there exist some malformation. At the period of birth, the chest has acquired considerable dimensions; yet with respect to the abdomen, it is much less capacious than at a more advanced age, and especially in the adult.

During the time the pectoral cavity is acquiring an increase in its dimensions, the lungs themselves have also passed through their different stages of development.

About the sixteenth week, the lungs first appear; they are much lower than the heart, and it is said that in general they are less voluminous. When the lungs first appear, they have a smooth white surface; but in proportion as the child advances in age, grooves appear indicating the separation of the lobes, and then lines which mark the division of the lobes appear on the external surface of the lungs; next they are solid; the veins, arteries, and bronchial ramifications begin to grow; and their size increases at the same time that the pectoral cavity enlarges, they assume a rose color, and at the period of birth exhibit the anatomical characters which we shall now consider.

From the seventh to the ninth month, the lungs possess nearly the form which they afterwards have; but their color is different; and it varies in different children, for they are more or less pale or colored, according to the exsanguineous or plethoric condition of the subject. Some lungs exhibit red lichenoid spots on their surface, which would probably become slate-colored, or is observed on the surface of the lungs of an adult; others, on the other hand, are white, or of a faint rose-color; their color has a close resemblance to those of an ox or a calf.

During intra-uterine life, the lungs fill the entire pectoral cavity, against the sides of which they press to such a degree as to receive the impress of the ribs, which are always more projecting on the interior of the thorax in a child than in an adult. These are mentioned that it may not be considered an effect of a pathological condition. The same thing has been noticed in the case of adults, and it is possible that these formed during intra-uterine life, and continued to an advanced age.

When the thorax of a child that has not respired is opened, one is struck with the analogy between the thymus gland and the two lungs; it would seem as if this body was a third lung, in which no bronchial ramifications appear. This resemblance is noted because after birth the thymus gland, preserving still the same aspect, may serve as a point of comparison, and guide us in the examination which we propose to make of the tissue of the lungs when modified by respiration or not. The pulmonary tissue in which the air has not penetrated, is flabby and reddish, like the tissue of the spleen: for notwithstanding the existence of the ductus arteriosus, which allows the blood sent from the heart to pass directly into the aorta, yet a certain quantity penetrates the lungs. either by mechanical reflux, or that because this blood is necessary for the purpose of nutrition of the organ, so that the pulmonary arteries and veins are very frequently filled with blood at some distance from the pulmonary tissue. The bronchi, usually of a pale rose, are sometimes colored by a slight sanguineous exudation.

After birth the tissue of the lungs that have been penetrated by the air respired by the child, becomes lighter and crepitating, and always possesses more blood, all other things being equal, than the lungs of adults. In almost all young infants, there is also found a very evident sanguineous congestion at the posterior border of the lungs, and especially on the right side. But it is evident that this congestion is a true mechanical phenomenon, and is believed that the congestion occurring on this side arises from the common prejudice of the nurses in being careful to lay the child in bed on the right side. Notwithstanding this congestion of the pulmonary tissue, the bronchi are not always red, but are usually distinguished by their white appearance, contrasting strongly with the redness of the parenchyma of the lungs. (Billard).

The bronchi, during the period of childhood, are quite small, but enlarge at the same time that the larynx undergoes a change.

Malformations.—The trachea instead of being divided into two large branches, a right and left bronchus, has been found divided into three, and usually in such a manner that there were two right bronchi, instead of one bronchus. In these cases the third bronchus is of lesser calibre than the two others, but is of the same conformation and descends into the upper lobe of the lung.

Further malformations to be mentioned are: Absence of individual tracheal cartilages; coalescence of several tracheal cartilages into one; an excessive number of cartilages; their abnormal division longitudinally or horizontally; their abnormal size, configuration and texture; atresia, blind termination of the trachea; closure of both branches of the trachea; communication of the œsophagus with the posterior wall of the trachea, the pharynx terminating in a blind extremity and that portion of the œsophagus ascending from the stomach opening into the trachea. Lastly, doubling of the trachea.

Congenital fistula of the neck is of greater clinical interest than the foregoing and depends upon imperfect closure of the third or fourth bronchial cleft; or, in median fistula upon imperfect union of the third or fourth bronchial arch in the median line. Usually the external orifice of the fistula exists on the side of the neck half an inch or an entire inch above the sterno-clavicular articulation, either between the two heads of the sterno-cleido-mastoid muscle or at its inner border. Less frequently it exists higher up as far as the cricoid cartilage and towards the median line. As a rule there is but one fistulous opening, situated most frequently on the right side, and less frequently in the median line. When, as is rarely the case, there are two openings, they are symmetrically situated on each side of the neck. In a case reported by Acherson there were as many as three openings observed, situated one above the other. The external orifice is small, as a rule, so that it can be penetrated only by a very delicate probe or a bristle. The borders of the opening usually project somewhat forwards; and they are tumid and not infrequently reddened. The fistulous tract leads either into the larynx or pharynx or into the trachea. The last-mentioned variety is exceptionally rare. It much more frequently happens that the fistula terminates blindly in the connective tissue of the neck; or that, sometimes, a small cyst-like pouch is formed behind the orifice (incomplete fistula). The calibre and orifice of the fistulous tract, even in those instances in which the tract opens into the trachea (complete fistula) are usually so small that bubbles of air are but seldom expelled externally. In those cases in which the fistula terminates blindly in the connective tissue mucus only escapes from the external orifice—as a matter of course only in a minimum quantity.

Real tracheal fistulæ are much less frequent than incomplete cervical fistulæ and the so-called cervico-bronchial fistulæ. These fistulæ occur in the middle of the neck in most instances. Sometimes there is only one simple very minute orifice; sometimes a tumor extends from the chin down to the region of the *manubrium sterni*, in the upper or lower portion of which a delicate opening, the fistulous orifice is found. If the fistula is incomplete it is gradually lost, blindly, in the tissues, and permits merely a yellowish fluid to trickle outwards. The complete tracheal fistula, on the contrary, presents an open communication of the fistulous tract with the trachea, and is usually located in the middle line of the neck. It is further worthy of mention, that up to the present time, tracheal fistulæ have been observed almost only in females. The diagnosis of congenital tracheal fistula is chiefly dependent upon the evidence of a direct communication of the external fistulous orifice with the interior of the trachea, whether it be determined by means of the probe or by escape of air through the external orifice on forced blowing and similar manæuvres. (Riegel).

Of the lungs, an extreme smallness of one or both or a narrowness of the pectoral cavity may occur; or the abdominal viscera may be found in the thorax in consequence of malformation of the diaphragm. The lungs which present on one side two lobes, and on the other three, separated by deep fissures, may exhibit a unique mass without division, or divisions inverse to those which exist in a normal state, or, fissures more or less numerous. The inversion of the right lung, to the left side, and *vice versa*, is usually found with inversion of the heart. Finally they may not be contained in the thoracic cavity when the walls of this cavity are incomplete in consequence of an original malformation.

Among these malformations, those of the pectoral cavity which may oppose a free expansion of the lungs in the act of respiration, will cause, in new-born children, symptoms of a nature more or less serious. It can be easily conceived that when a congenital diaphragmatic hernia exists, and the stomach, omentum, or intestines are introduced into the thoracic cavity, a considerable obstacle will exist to the proper dilatation of the lungs, and give rise to a variety of symptoms. It is not necessary that there should be so great a malformation in that cavity to produce an evident disturbance in the functions of the respiratory apparatus; the simplest malformation will sometimes give rise to symptoms that would almost lead to the belief that they were the result of a lesion of the bronchi, pleura, or lungs. These symptoms may perhaps be little apparent at the period of birth, but in proportion as the child advances in age, and the functions of respiration become developed, and the necessity of a greater expansion of the parieties of the thorax arises, when they are too narrow, or too much depressed, they oppose the dilatation of the lungs, producing symptoms which might be attributed to some lesion of the lungs or bronchi, if post mortem examination did not prove their integrity. (Billard).

The functions of the lungs present the most remarkable changes of any occurring in the infant frame; for when in a normal condition, they almost instantaneously perform their appropriate function on the application of their natural stimulant, thus changing at once the condition of the child from a parasitic to an independent state of existence.

Respiration is carried on with great activity in the infant, amounting to thirty-five or forty inspirations in a minute, those of the adult averaging eighteen or twenty in the same period. Although this is stated to be about the number of inspirations, yet it is extremely difficult to ascertain the fact with much precision, for when the thorax is uncovered in order to observe its movements, the exposure causes an immediate acceleration in the action of the respiratory muscles. Nothing, therefore, can be ascertained with any degree of satisfaction as to its indicating the violence of diseased action. When they are noisy, from any obstruction in the nasal passages, the respirations may be counted.

A remarkable circumstance in the manner in which respiration is performed by an infant is, that the ribs alone are the chief agents, the diaphragm acting but little, the size of the abdominal viscera not permitting it easily to descend. Infants, when sucking, breathe altogether through the nose; when this is obstructed by tenacious mucus, great difficulty is experienced both in breathing and sucking. The nose is, therefore, at this period, an important appendage to the respiratory apparatus.

Children of all ages, but especially during infancy, require a free supply of pure air, as is evident from the fact of the great number of deaths in large cities, and more especially in the crowded alleys, densely populated houses, and hospitals for young infants, or under any circumstances where there is an evident insalubrity of atmosphere. All animals, especially when young, have been known to suffer from this cause.

On percussion, the chest of a child is very sonorous, owing both to the small development of the muscles covering the part and to the free and active condition of the ultimate termination of the bronchi; and it is probably owing to the same cause that the respiration in children is much louder than that of adults; and when a portion of the lungs is required to perform more than its ordinary amount of functional power, from disease existing in its vicinity, a similar sound is heard on auscultation, and for this reason is called *puerile respiration*. This remarkable condition of a child's lungs exists until about the twelfth year, when respiration assumes the characters peculiar to it in the adult.

On the establishment of respiration, the child cries, caused doubtless by the painful impression made by the cold air, for the first time applied to the surface of the body and lungs; this feeling of excitement, or perhaps some degree of distress, appear from the rapid movements of its arms and legs. (See p. 609.)

ANTENATAL DISEASES OF THE CHEST.

As has already been noted, the lungs are not exempt from antenatal diseases. Grætzer (*Die Krankheiten des Fœtus*, p. 163, 269) collected several cases. Billard and Cruveilheir observed that in the bronchial tubes we find concretions, polypus masses, and evidences of inflammations; and the latter mentions a case of death immediately after birth, in which the bronchi were filled with a thick mucus, apparently the result of chronic catarrh. It might, however, have been due to inspiring the mucous discharge during birth.

Congenital Pneumonia and Pleurisy.—Inflammation of the pleura and lungs may occur before birth. Some accoucheurs, and among others Mauriceau, have given instances of its occurrence. Many opportunities of proving this fact occur. In three children that died on the day after birth, Billard found an alteration sufficiently advanced to satisfy him that the disease had commenced while the child was in the uterus. In two particularly, the left lung was strongly hepatized at the base; and if this alteration in the tissue did not exist during intra-uterine life, it probably was developed during birth or immediately after. This affection always interferes with the establishment of respiration, and consequently causes the death of the child.

Examples of lobular pneumonia are recorded by Cruveilheir; of sanguineous effusion by Meade, Wirsberg, Joerg; of abscess of the lungs by Koelpin, Mende and Cruveilheir; of pleurisy by Veron, Billard, Orfila and Cruveilhier; of tubercles by Hudson, Chaussier, Cruveilhier, Lobster and Billard; of schirrhus by Wrisberg; of œdema of the lungs by Zierhold; and of hydro-pneumonia by Grætzer. The latter might easily be mistaken for the natural physiological conditions of these parts before birth. Carpenter says, p. 946: "Up to a late period in the development of the human embryo, the lungs do not nearly fill the cavity of the chest, and the pleura of each side contains a good deal of serous fluid."

ASPHYXIA NEONATORUM — APNŒA — SYNCOPE.

This is a condition in which the respiratory muscles after delivery do not contract at all, or only imperfectly. It may be due to three causes, viz., apnœa, asphyxia and syncope.

Apnœa or want of breath is perhaps the most common form of defective respiration and is usually diagnosticated asphyxia apoplectica. The child presents a red bloated face; mouth blue, body warm and red with mottled spots here and there. The infant is large and well developed.

In *asphyxia* proper, or asphyxia suffocatoria, respiration is obstructed from the profuse amount of mucus blocking up the nasal passages, or larynx. The face and lips are blue, eyes protrude. There may be partial respiration at first, but from inhaling some of the discharges with the first rush of air the bronchial tubes become finally closed, especially if the nurse does not facilitate the ejection of the mucus. The cry in these cases is hoarse and rattling. The children are usually large and fat.

Syncope or faintness is really due to impeded or arrested circulation. This form of suspended respiration is found in cases of compression of the cord, rupture of the cord, or premature separation of the placenta, as in multiple births. Prolonged and forcible contractions of the uterus may bring about this faintness. In a case of triplets all were born in a state of syncope from prolonged labor. The last was beyond the power of resuscitation.

Treatment.—The management of each of these forms of asphyxia will radically differ.

In apnœa proper, asphyxi, apoplectica, the pressure of blood to the brain is so great as to produce stasis of the blood, and paralysis of the respiratory muscles. Allowing the cord to bleed will often relieve. Placing the body alternately in hot and cold water will tend to contract and relax the capillaries, and thus relieve the pressure upon the brain, and at the same time stimulate the respiratory muscles to contract. In these cases respiration is ushered in, usually, with a gasp. Artificial respiration by placing the child alternately in the sitting and recumbent posture, should be resorted to. Blowing into the mouth and thus forcibly dilating the air vesicles will help to start the respiratory act. Pouring cold water over the head sometimes works nicely.

In the suffocative form where mucus obstructs the air passages at any point, this must be removed before the normal entrance of air will be facilitated. The finger may be introduced into the glottis and the occluding mucus removed. Holding the child by the heels will by the force of gravity tend to clear the larynx and trachea. Blowing into the mouth, after having put a drop of *Alcohol* on the tongue, may stimulate absorption of the mucus, and contraction of the air vesicles and lesser bronchi.

In a case of triplets still-born, the author was enabled to start respiration in two of them by blowing in the mouth about six times a minute. The third infant was exsanguinated, from, I think, exfoliation of the placenta some time before birth. A more rapid labor would doubtless have saved this child, although they were all less than eight month fœtuses.

One precaution should always be taken; Not to blow too forcible into the mouth of the child. A catheter passed into the trachea may be used. Eberle, p. 79, records a case of rupture of the air cells by this means. The steady respiration of health should be simulated. Vogel says: If we succeed at all in saving an asphyxiated child, we usually accomplish it in one or, at the most in two or three hours.

The management of apparent death from syncope demands prompt recourse to position. The child should be suspended by the heels as in syncope from anæsthesia, until the face becomes turgid by the force o gravitation filling the capillaries of the brain, then artificial respiration should be resorted to for a few moments, then if the face becomes pale, again the head should be lowered and artificial respiration again protracted until the normal respiration is fully established. If the cry is feeble, it will be best to keep the head dependent, as we would in a case of severe hæmorrhage in childbed. Gravitation must help keep the brain properly supplied with blood, until the system has manufactured enough to make up the loss, or if there has been no loss until the nervous energies are fully recovered, and the nerve centres properly supplied with their appropriate food by a steady current of blood.

Aconite should be given when the child is hot, purple, pulseless and breathless or nearly so. Apoplectic form.

Belladonna would be preferred when the face is very red and the eyeballs injected, pupils dilated. Apoplectic form.

China will be called for in cases of syncope or where profuse hæmorrhage has been the cause.

Tartar emetic.—In the suffocative form where the child is pale and breathless, although the cord still pulsates.

Ipecac is recommended by Hartmann in these cases.

Camphor may be given instead of either of the above remedies, and especially in cases from syncope, also after *Tartar emetic.*

The efforts at artificial respiration should be persevered in for some time. Cases are on record where success has occurred after two hours constant effort.

Signs of returning life are: Slight twitchings and tremulous motions around the mouth, contractions of the pectoral muscles, which at first may be very slight, returning warmth and redness of the lips, motion of the froth at the mouth, and at last audible respiration.

In these cases of asphyxia respiration is usually feeble for some time. Then it should be treated as directed under the head of Asthenia or General Feebleness, p. 127, and Atelectasis.

ATELECTASIS PULMONUM.

Atelectasis pulmonum, signify imperfect expansion, and is used to designate a condition of the lungs in which larger or smaller portions of these organs remain undistended by air. The respiration of the infant is established in such cases, more or less imperfectly at birth, while some parts of the pulmonary tissue never undergo expansion under the distending influence of the inspiratory act; these undilated parts remain in the fœtal state. In addition to this *congenital* form of imperfect expansion of the lung tissue, this condition is met with at all ages of life, though with especial frequency in young children, as the consequence of a *collapse* of portions of the once expanded lung, or in other words, of their return to the fœtal or unexpanded state. To this latter form of imperfect expansion, the terms "post-natal atelectasis," "collapse," and "fœtal condition" have been given. Before the discovery of its real nature was made, it had often been described under the names of "carnification" and "lobular pneumonia." (Meigs & Pepper).

Congenital Atelectasis.—If the body of a new-born infant is examined, or one that has survived its birth but a few days, there will sometimes be found patches of lung having a dark red color, and depressed below the surrounding tissue, thus giving the surface of the organ an uneven appearance. These darker portions which exactly resemble fœtal lung, are solid to the touch, do not crepitate at all under the finger, and sink immediately if thrown into water, while no minute air-bubbles are intermingled with the small quantity of reddish serum which pressure causes to exude from their divided substance. They are not friable nor easily torn, their cut surface is perfectly smooth, closely resembling a piece of muscle, and if examined under a lens, the pale, collapsed air tubes are seen intersecting their substance and scarcely distinguishable from the small vessels, which are almost devoid of blood.

If air is blown into a lung some lobules of which have this appearance, it will permeate the collapsed air-tubes; the pulmonary vesicles will by degrees become distended, and the solid lobules will rise to a level with the rest of the lung, will acquire the same color and consistence, and, like other parts of the organ will float in water. A single inflation, however, is by no means sufficient to render this change permanent, but the moment the tube is withdrawn the air will escape, and the recently distended lobules will again collapse and sink below the rest of the lungs; their color, too, will become dark, though less so than before. Even after the lung is distended to the utmost, a ligature is passed around the bronchi, and the lung allowed to dry, a difference will still in general be very perceptible between the size of the air vesicles which had been artificially inflated, and those which had been distended during life by the natural process of respiration.

The situations in which this condition is most frequently met with, are the languette and lower edge of the upper lobes, the middle lobe of the right lung, and the posterior part and lower edge of the lower lobes. It is usual to find in connection with this state of the parenchyma of the lungs, that the pulmonary vessels contain less air than usual, that the foramen ovale is usually open and the ductus arteriosis but very imperfectly closed. (West).

Etiology.— The causes of congenital atelectasis have not been satisfactorily ascertained. The only conditions that have been well made out as probable causes are: Original debility of the infant, from any cause that has interfered with its proper development in utero, as feeble health on the part of the mother during pregnancy or multiple pregnancy. A very hurried and rapid labor has been thought to cause, in some instances, this imperfect expansion of lung substance. (Meigs & Pepper).

Symptoms.—Cases in which this condition of the lungs exist, usually present the history of the child having been apparently still-born, and though resuscitated after a time, yet still continuing unable to utter a strong and loud cry like that of other children; or, the child comes into the world feeble and weak, and instead of crying vigorously and loudly the moment or very soon after it is born, it fails to cry at all, or the cry is low and weak, or it is whimpering or wailing; the color, instead of being brick-red or dark-red, is pale and whitish, leaden or livid (cyanotic); the muscular movements, which in healthy children, are strong and vigorous, are in these languid and slow, or there are none or scarcely any, the limbs being relaxed and motionless. If the breathing is observed, it is found to be accelerated, superficial and insufficient, and the hollow between the chest and abdomen is exaggerated (the peri-pneumonial furrow). When these symptoms exist in a very marked degree, the infant either dies soon in a state of asphyxia, or, the muscular force slowly increasing, the respiration gradually improves, and the child is, after a longer or shorter time, either out of danger or it falls into the same state as that of one in whom the symptoms have been from the first less severe. Under the latter circumstances the infant continues feeble and weak. The cry is rare, and when heard is low and feeble, or there is a constant plaintive moan, which is very characteristic, and strongly expressive of exhaustion, with each respiration. The color continues pale and whitish, or it is bluish, and the temperature of the extremities is lower than natural. They may be observed in slight twitching about the muscles of the mouth. The child sleeps the greater part of the time and is unable to nurse, or nurses very feebly, but can swallow when fluid is poured into the mouth. In such cases as these, the infant does not necessarily die, but will often recover when properly treated. In favorable cases, the symptoms just enumerated may last from a few hours to a day or two, or even a few weeks, without much change; then under proper care they will often begin to improve. The color is less pale and bluish; the muscular movements are stronger, the child cries in a louder tone and is able to suck when applied to the breast, at first feebly and only for a moment, and then more strongly. In unfavorable cases the respiration becomes more and more short, quick and imperfect; the temperature of the body falls; the color of the surface changes, becoming leaden, bluish or livid; difficulty in swallowing is greater and very generally some spasmodic twitchings begin to show themselves about the muscles of the face. The respiration is often attended with slight wheezing or rattling, or an occasional cough, and the convulsive movements returning frequently, and becoming more violent and more general, the child dies in convulsions, or it sinks very slowly and gradually, without convulsions as though in a state of syncope.

Symptoms of Collapse of the Lung in the early Weeks of Life.—There is a form of atelectasis appearing in the first few weeks of life, in infants who have exhibited no sign of it whatever, perhaps at the moment of birth, but which resembles that of congenital origin. The symptoms are those of cyanosis, and in some instances are as strongly marked as those observed in the worst cases of that condition, caused by malformation of the heart or great vessels. The cyanosis and other symptoms of disordered circirculation, evidently depend on the obstacle offered by the collapsed and condensed portions of lung tissue to the discharge of blood from the right side of the heart. Through this obstacle to the venous circulation is doubtless the chief cause of the symptoms in these cases, the difficulty is also in part due to the fact that the fœtal openings, the foramen ovale and ductus arteriosus, and especially the former are still patulous, or in such a condition, that they be re-opened under pressure and so allow a portion of the contents of the overloaded and congested right side of the heart, to pass into the left auricle, thence into the left ventricle and aorta, and so to the whole body.

In this form of atelectasis, the child may have been born perfectly healthy, or only weaker than usual, or it may have had some difficulty in establishing the respiration, which, however, has afterwards been affected in the most complete manner. Some days or even weeks after birth, from a cause disturbing the function of respiration, portions of the lung may collapse, and give rise to the different symptoms of that condition heretofore described. The most important of these are difficulty of breathing, consisting either in an increased or diminished rate of that function diminution of the muscular power, cyanotic hue of the skin, and slight or severe spasmodic phenomena. There is another form of collapse occurring during a severe attack of lobular pneumonia or capillary bronchitis from obstruction of the bronchæoles with mucus.

Diagnosis.— There can be no difficulty in detecting the nature of the case when the imperfect expansion exists from birth and when the physician is present at that event. When, however, collapse of the lung tissue continues after birth and the physican is called upon to determine at the age of some days, weeks or even months, the cause of the feeble health and puny growth of the child, or to explain the sudden attacks of collapse in very young infants who had previously well established to all appearances the respiratory function, the diagnosis is more difficult. In the former class of cases, the previous history is particularly important, since in all such cases it will be found that the infant was either still-born and resuscitated with more or less difficulty or that it was born weak and feeble, and that the respiration had not been established as thoroughly and completely as it ought to have been. The present symptoms are also very important. The feeble appearance of the child, and its puny growth, in connection wth its past history and the absence of other morbid conditions to explain the ill health, ought to direct the attention of the physician to the true nature of the disease; added to these considerations the local thoracic symptoms, the short, rapid and imperfect breathing with perhaps, the altered movement of the ribs, the indentation instead of the expansion during inspiration; the absence of fever and the existence of the physical signs of more or less solidification of the pulmonary tissue, ought to lead to a correct diagnosis.

The cases described under the head of collapse in the early weeks of life, may be readily understood from the simple fact that the symptoms cannot be satisfactorily explained by referring them to any other condition than that of collapse of portions of the lung, with impeded and deranged circulation. (Meigs & Pepper).

The *treatment* must necessarily differ in the different forms of the disease. In the congenital form the indication, as in apnœa, is to thoroughly inflate the lungs by either inducing a prolonged cry, or by artificial respiration or both. This may be the best management for the acquired form, also. In collapse of the lungs during bronchitis artificial respiration will assist the action of the remedy. In the selection of the remedy consult those under apnœa, croup, catarrh, bronchitis, laryngismus and pneumonia as well as the following:

Aconite.—Great difficulty in inspiring; very restless and distressed; easier with its head and shoulders raised to a sitting posture or while being held.

Belladonna.—Face a bluish-red, or alternating with a very pale face; eyes seem injected; respiration seems painful; much whining and crying; the child seems afraid to breathe.

Bryonia.—Color of the face is of a bluish-red; great difficulty in inspiring, seemingly as if the lungs could not expand, and the child is *evidently easier* when lying down and kept very quiet.

Camphor.—Bluish color of face; the child's surface feels very cold; rather more difficult in making an inspiration; very great difficulty; better when lying down.

China.—Face very pale; the trouble all seems to be from loss of blood, or great weakness.

Cuprum.—Color of the face bluish; difficulty of respiration; much rattling of mucus, and rather *inclined to spasms*, which are first seen in the fingers and toes and extremities.

Hyoscyamus—Bluish color of the face; great difficulty in inspiring; must be raised up; all the muscles of the body and face incline to twitch and jerk.

Phosphorus.—Color of the face is very changeable: the child is hoarse; long and slender in its figure.

Spongia.—Face reddish; crowing respiration; no mucous rattle; *must be raised up.* (*Aconite*).

Tartar emetic.—Very pale face; more difficulty in expiration; head hot and sweaty; much rattling of mucus, more in the throat pit.

Veratrum.—Face bluish; much exhaustion; cold perspiration on forehead or other parts of the body; almost pulseless.

BRONCHITIS. BRONCHIAL CATARRH. CAPILLARY BRONCHITIS. CONGESTIVE CATARRHAL FEVER.

Bronchial catarrh, next to intestinal catarrh, is the most common disease of infancy. At the Prague Hospital for Sick Children, out of an annual clientale of 9,000 patients, there are on an average 1,300 children suffering from catarrh of the air passages. (Steiner).

In the physiological condition all mucous membranes are covered with a certain amount of secretion, essential to the functions of mucous membranes. Now the bronchial mucous membrane likewise secretes a certain quantity of mucus, and in fact just enough to prevent its becoming dry. Every hyperæmia of the membrane causes an augmentation of the secretion; more is poured out than is evaporated, and the consequence of this is an accumulation of mucus in the bronchi, which condition has been denominated bronchial catarrh, or, in severer forms, bronchitis.

Etiology.—There is hardly a child living who has not had a bronchial catarrh in early life, and there is no age at which this affection occurs oftener than in that of the first childhood particularly at the time of the first dentition. Thus for instance all children cough who drivel during dentition, for the garments are perpetually kept wet by the saliva, and that produces a cooling of the chest. Bronchial catarrh prevails more generally in winter than in summer; in the cities and quarters inhabited by the poor, more frequently than in the country. Children reared in dusty manufacturing cities usually suffer, and children of tuberculous parents so regularly suffer from it that it does not at all attract attention and therefore is not mentioned, if special inquiry be not made concerning it. Besides these more external causes, there is also a contagio which conveys the bronchial catarrh from one person to another, namely, influenza. Essent it consists of a bronchial catarrh, which is ushered in by febrile symptoms and anorexia, and spares no age, not even the youngest infant. In healthy children, influenza has its regular course, and in from two to three weeks, terminates in complete recovery, in tuberculous children, on the contrary, it often ushers in the further development of the cachexia, the children continue to cough, become feverish and finally perish in a hectic condition. Bronchitis is a constant symptom of measles, where it probably originates through a morbillous efflorescence of the mucous membrane, and hence must occur without any exception. It is frequently met with in scarlatina, and in genuine and spurious variola.

Pathological Anatomy.—Bronchial catarrh may occur either in the bronchi of the first and second order alone, the smaller remaining unaffected or conversely; the principal morbid alterations are found in these, while the large bronchi remain normal, or finally the bronchi of all orders may be uniformly affected. (Vogel). According to the seat of the disease the title of acute ordinary bronchitis is applied when it is confined to the larger bronchi, the inflammation not extending to the capillary tubes, and capillary bronchitis when it has attacked the capillary bronchi. Patients seldom die of the first-named variety of the disease.

The affected portion of the mucous membrane is of a pink-red color, where the inflammation has attained a high grade. Its vessels present an arborescent, injected appearance, and this injection increases more and more and finally in the highest grade becomes so intense that the mucous membrane assumes a scarlet-red, velvety appearance. At the same time it increases in thickness, as may be ascertained by making a few transverse incisions into it, and by comparing the incisions of a normal bronchus with those of a catarrhal bronchus, both being of the same order. In addition the mucous membrane appears softened and is easily lacerated. (Vogel). Associated with the changes in the mucous membrane of the bronchi there is an alteration in the character of their secretion. At first no doubt this secretion is suppressed, just as we see that furnished by the Schneiderian membrane to be in a common cold, but afterwards it is poured out abundantly and next ceases to present its natural characters of a glairy mucus; becoming opaque, thick, puriform or actually purulent, while in a few less common instances, the secretion assumes the form and consistance of false membrane, constituting a true croup of the bronchi. Traces of blood are but very seldom observed in the secretion, and the quantity of air-bubbles intermingled with it is usually in inverse proportion to the thickness of the secretion and its abundance. But not only are the contents of the air tubes altered in character and for the most part, increased in quantity, but the tubes themselves often undergo a marked alteration in their calibre and become greatly dilated. This dilatation is usually observable from the secondary bronchi to the minutest air-tubes; the branches often being as large as the parent trunk, or even larger; but that fusiform dilatation which is met with in the adult has not been noticed. Dilatation of the bronchi was once supposed to be the purely mechanical effect of the accumulation of the secretions within them. There is, however, no constant relation between the quantity of the liquids within the bronchi and the degree of their dilatation and two other circumstances must be looked to as being the primary causes of the occurrence. The first of these is the weakening of the muscular fibres of the bronchi by the inflammatory action; the other, the loss of the ciliary epithelium which lines the air-tubes when in a state of health, and contributes by the incessant vibration of its cilia to keep them free for the access of air. (West).

It is thought, and with reason, that the presence of mucosities in the bronchial canals affords a considerable obstacle to the return of the air, which thus finds itself imprisoned in the air cells. At each inspiration fresh portions of air have a tendency to add themselves to those which are already included; an incessant compression and dilatation in the bronchial extremities thus results. (Bouchut).

Whenever bronchitis has reached such an intensity as to give rise to the abundant pouring out of thick fluid into the air tubes, so that the air can no longer permeate them with facility—while this difficulty is still further increased by the loss of the ciliary epithelium, and by the weakening of the contractile power of the bronchi, which would have helped to keep them free—it often happens that the feeble inspiratory power of the child becomes wholly inadequate to fill the lungs, and bronchitis thus becomes the indirect cause of pulmonary collapse.

In some cases the inflammation of the respiratory mucous membrane extends further than usual along the smaller bronchi, until it involves their extremities, and the pulmonary vesicles themselves, when it produces an appearance almost peculiar to childhood, and which has been described under the names of catarrhal or vesicular pneumonia or vesicular bronchitis. A lung, or a portion of a lung, thus affected, no longer contains any air—it is dark in color, and feels tough, though solid; its surface is beset by a number of small, circular, yellow, slightly prominent spots, of the size of a millet seed or smaller, which on a hasty glance, present a very great resemblance to crude tubercles. A little attention, however, suffices to distinguish between them; for not only do these yellow spots differ from tubercle, in their favorite seat being along the lower margins of the different lobes, but on puncturing them with the point of a scalpel a drop of pus will exude and the yellow spot will disappear. Sometimes, too, a minute bronchus may be traced running to its termination in one of these little sacs. (West).

It is remarkable that lungs thus affected do not collapse on opening the thorax, on account of the large quantities of the accumulated secretion, which prevent a communication between the external air and that in the lungs.

Atelectasis and emphysema of the lungs and sometimes also inflammation of the pleura may be results of catarrhal affection of the air passages. Some degree of congestion of the lung is almost constant if bronchitis is at all severe, with stagnation in the more dependent portions of the lung, and dark, solid, non-crepitant patches are formed.

Symptoms.—They are divisible into subjective and objective. The subjective only come into consideration in children who are more than two years old, and consist of pains along the sternum, to which, during cough, a girdle-like pain corresponding in direction to the insertion of the diaphragm, becomes superadded, and sometimes in a general *malaise*, which manifests itself by a depression of spirits, and disgust for the customary amusements. The objective symptoms are derived from physical exploration, from the kind of cough, the expectoration, and the invariable fever. There are three forms of the disease, varying in severity and results.

1. Acute bronchitis of moderate severity.
2. Acute suffocative bronchitis, the broncho-pneumonia of Seifert, capillary bronchitis, congestive catarrhal fever.
3. Sub-acute or chronic bronchitis.

After a slight febrile attack which often escapes observation, the young child coughs; and this is the first symptom which attracts the attention of the parents. This cough is usually dry, and by exception composed of numerous fits of short duration, without any special character. Generally the paroxysms of cough are tolerably severe, and last from half to one minute, recur several times in the hour, are less frequent during sleep, but do not cease completely. Many children sleep on notwithstanding the cough; others, however, always wake up and from these constant interruptions in their night's rest become very much reduced. The short, abrupt, frequently-recurring hacking cough is very suspicious, for it usually points to the existence of tuberculosis. A bad sign furthermore is, when the children cough more when laid on one or on the other side than on the back, for this cough, too, in most cases is due to great material alterations in the pulmonary structure. The cough finally becomes moist, thick and the fits of cough disappear. There is no expectoration under five years of age. The face preserves its natural expression, with the exception, however, of a little languor and weakness of the eyes. It does not present any extraordinary color. The respiration is always slightly accelerated, but without modification of the external respiratory phenomena. These movements are accomplished a little more quickly, but without jerking, without perversion of rhythm, without considerable muscular efforts, and without convulsive agitation of the nostrils. The resonance of the thorax is not all modified. Auscultation reveals at the commencement, on both sides, the presence of sibilant, sonorous, snoring rales; at a more advanced stage the same rales, to which the mucous rale, either dry or humid becomes added. The appetite is not materially lost; there is no vomiting or diarrhœa; the mouth is not dry and yet there is slight fever. The pulse is a little more frequent than in the normal state, and presents a slight acceleration on the approach of night. At this time the skin, which was without heat becomes burning, and remains in this state until the pulse has slightly fallen.

Such are the unequivocal symptoms of bronchitis of the larger air tubes, so that partial bronchitis can hardly ever be mistaken.

But there are attacks more severe than this, and while the symptoms resemble very much those described, they are all more intense. The cough is tighter, more frequent, harassing, and especially is it more painful, as shown by the fact that the child cries and complains, and that a marked expression of pain passes over the face at the instant of coughing. There is more fever, the skin being hot and dry and the pulse more frequent, rising often to 130 or 140. The respiration is hurried, and though not attended with the same la
anxiety as in the capillary variety, it is evidently oppressed

been counted as high as 60. There is more restlessness, fretfulness, and general distress; the appetite is greatly diminished or lost, and infants nurse with less avidity than usual or refuse to nurse at all for several hours together. The physical signs are more decided and are heard over a larger extent of the surface of the chest. The symptoms are almost always most marked and severe in the after part of the day and night. Very often the patient will be comparatively easy and comfortable in the morning, but as the day goes on, becomes more feverish, restless and fretful; the cough grows more troublesome, more frequent and tighter; the breathing is quicker and more oppressed; the face is more flushed; the sleeping is broken and disturbed, and the child may appear through the night quite ill, and yet as morning approaches, the symptoms moderate, the skin often softens and becomes moist, and the whole aspect of the case shows a great amelioration.

In either of these different degrees of acute simple bronchitis, the patient is liable, especially if it be a weak and debilitated child, or a young infant to sudden and alarming aggravations of the symptoms. The breathing becomes suddenly either greatly increased in frequency, or excessively labored and oppressed, the surface becomes pale, the expression dull and languid, or distressed, the child is drowsy and inattentive, or uneasy and restless, the hands and feet are coolish, the act of sucking is performed with difficulty, or the child refuses the breast entirely, and it is evident that from some sudden change in the condition of the lungs, the act of respiration and the aeration of the blood are very seriously interfered with. If this sudden aggravation of the symptoms be unattended with a corresponding increase of the febrile phenomena, as marked by greater heat of skin and augmented action of the circulation, it is altogether probable that it depends on a collapse of larger or smaller portions of the pulmonary texture, and if on examination, dullness on percussion is discovered, distant bronchial respiration and cessation or greatly diminished abundance of the bronchitic rales, over parts of the chest where a few hours or a day before there had existed all the physical signs of bronchitis, there can be no longer any doubt as to the cause of the suddenly increased severity of the symptoms,—it must be owing to collapse (atelectasis).

Acute suffocative bronchitis or capillary bronchitis may succeed to the form just described, or it may appear as an idiopathic affection, but it is very rarely observed to originate primarily, being nearly always preceded by partial bronchitis. Under either condition the general symptoms are more threatening than in the preceding form and the disease soon assumes all the appearances of great severity. The child is very uneasy and restless, constantly changing its position, moving about in the crib or bed, or insisting on being changed from the bed to the lap or from the lap to the bed. The expression of the face is anxious and disturbed and its color usually pale or slightly bluish. The temper is irritable or subdued; the child hates to be disturbed, and generally chooses its own position. The respiration is very much accelearated, running up in a very short time to 60, 70, or 80, and it is usually more or less irregular, and evidently laborious and difficult. The cough is very frequent, troublesome and evidently painful; it occurs in short paroxysms usually, with or without stridulous sound, is at first dry and after a few days is accompanied in older children by whitish or yellowish expectoration. In some instances, the sputa consists of mucus tingled with blood, or of pure blood even, and still more rarely of mucus mingled with small shreds of false membrane. The appetite is entirely lost, the tongue is usually moist and furred white; there is acute thirst and yet in severe cases though the presence of acute thirst is evident from the manner of the child, only very small quantities of water are taken, from the impossibility of suspending the respiration long enough to allow of more being swallowed; the drink is gulped rapidly, suddenly and with great difficulty, and after a time is refused almost entirely from this cause. In children old enough to talk, the speech is short and abrupt; the patient dislikes to speak from the fact that the effort obliges it to suspend momentarily the act of breathing. Fever sets in from an early period; the skin is hot and dry, and the face is flushed at first, though it soon becomes pale in most cases from the approach of an asphyctic state. The pulse becomes frequent rising soon after the onset to 130, 140, 150 or higher; it is full and hard early in the attack. The resonance on percussion is not modified. Auscultation reveals at first sibilant rales, mixed with some mucous rhonchus; but soon a fine subcrepitant rale is heard over all the lower parts of both lungs behind, and approaching, sometimes, over the bases of the lungs, the character of crepitus. After a time the subcrepitant rale is heard over the whole, or nearly the whole dorsum of the chest, and to a greater or less extent, though not so well marked as behind, over the anterior regions of the thorax. This rale is audible at first both in inspiration and expiration, and is very distinct, but at a later period, it is heard only in the inspiration, or there is substituted for it a mucous rale, while the subcrepitant rale is now heard only in the forced inspirations during coughing or crying. These rales are fugitive and irregular, disappearing or changing from one to the other after fits of coughing.

Should the case not take a favorable turn, the symptoms become more alarming; the oppression becomes excessive; fits of dyspnœa occur in which the child is extremely restless and distressed, tossing itself about on the bed; the respiration runs up to 80, 90, or more, in the minute, and is attended with violent action of the alæ nasi, the pulse grows more and more frequent, rising to 150 or 180, and it loses force and volume: and the face assumes a whitish or slightly bluish tint, looks puffed, and is sometimes covered with perspiration. As the fatal termination approaches more nearly, the pulse becomes small, thready and irregular; the respiration is uneven, irregular, stertorous, and often slower than before; the cough is smothered and less frequent; the restlessness generally diminishes, and the child sinks into quiet, and often becomes comatose; the paroxysms of suffocation are less frequently renewed, and less violent, and death occurs in a state of quiet insensibility, or is preceded by partial or general convulsive movements.

Subacute and chronic bronchitis generally follows one of the acute forms of the disease. The character and severity of the symptoms vary very much in different cases. Some children will present for several months together, in the winter season, slight bronchitic symptoms, consisting in wheezing and somewhat accelerated breathing; cough more or less frequent; occasional feverishness, especially at night; some diminution of appetite and loss of flesh: and sibilant and sonorous with mucous rales, heard here and there, but still without severe symptoms during the greater part of the time. Children laboring under this kind of bronchitic irritation are liable to more or less sharp attacks of acute bronchitis, in which they present the usual symptoms of that form of the disease. These attacks are very apt to occur coincidently with changes in the weather, and in some patients the liability to them is so great, from the excessive susceptibility of the system to the weather, that no care will prevent them. In some instances, an aggravation of the symptoms of the chronic form constantly occurs whenever the child is about cutting additional teeth, whilst in the intervals between the appearance of the successive teeth, the child remains comparatively well. Frequent attacks of severe bronchitis, together with the effect of a constant slight bronchitic inflammation, ends in the production of an emphysematous state of parts of the lung, and the child exhibits more or less marked asthmatic symptoms, which show themselves whenever a slight increase of the bronchitis occurs, and whenever the digestive system is deranged by imprudence in diet or other causes.

There are other cases, however, in whom the symptoms are much more severe. These almost always follow an acute attack of the disease. The frequency of the respiration and the attacks of dyspnœa persist; the cough is loose and paroxysmal, and the pulse frequent and small; evening exacerbations of fever take place, and the face and sometimes the rest of the surface are often covered with perspiration. Auscultation reveals tubal blowing, with mucous or loud sonorous rhonchus, which seem to indicate the presence of dilatation of the bronchi. Emaciation makes rapid progress, the face is pale and blanched, the eyes sunken, the nostrils are covered with mucus and bloody crusts, and the lips ulcerated. Strength diminishes progressively; the appetite is lost and the thirst acute; colliquative diarrhœa appears; and after twenty, forty, or more days, the child perishes in the last stage of marasmus. This form of bronchitis often simulates phthisis very closely, and may last for a long time, even several years. It rarely occurs under the age of five years. The expectoration consists of purulent or pseudo-membranous secretions in variable quantity. (Meigs & Pepper).

The bronchitis which is developed as a primary disease in children does not sensibly differ from the secondary bronchitis which comes on during the course of eruptive fevers and of other diseases of infancy. It is in no way modified by the presence of these diseases. Its characters are always the same, and its progress is not at all disturbed by them. (Bouchut).

Diagnosis.—Fleshy children are chiefly attacked. Nothing is more easy to recognize than bronchitis, which can not be confounded with any other disease. It is easily distinguished from hooping cough, the spasmodic cough of which, intermixed with the sonorous whoop is quite peculiar from bronchitis. The diagnosis between bronchitis and pneumonia is to be made out by the restriction of the physical signs to one side of the chest in pneumonia, the crepitus or subcrepitant rale, limited to the upper or lower portions of the lung, bronchial respiration, dullness on percussion, the greater sharpness, severity and location of the pain, the more acute fever, and the kind of expe toration when there is any. The diagnosis of capillary bronchitis is more difficult from its resemblance to lobular pneumonia.

Between croup and capillary bronchitis the following differentiation is to be made :

CROUP.	CAPILLARY BRONCHITIS.
Dyspnœa in more or less marked paroxysms.	Continuous intense dyspnœa.
Whistling inspiration, respiration labored.	Inspiration somewhat stertorous, respiration very short, rapid and panting.
Voice almost gone.	
Expectoration of false membrane in the form of a large tube, more frequently in shreds.	Expectoration of ramifying false membranes. (This does not often occur, but when it does it is decisive.)
On auscultation there is whistling or hissing respiration, and a weak inspiratory murmur.	On auscultation there are mucous and sonorous rales, often extending over a large part of the chest.

Prognosis.— Bronchitis is much more serious among children at the breast, and those who have not attained the age of five years. Up to this time the passage of bronchitis to the state of lobular pneumonia is very easy. After this period, the transition is more rare. General or capillary bronchitis is a serious disease, especially in lymphatic flabby children. It often leads to the development of lobular pneumonia and the prognostic consequences of that disease. It sometimes occasions death by asphyxia or collapse, without one being able justly to attribute this fatal termination to some scattered diseased lobules in the tissue of the lung. When bronchitis is developed in an enfeebled child, attacked by a chronic disease, resolution is difficult, the transition to the chronic state, or to the state of lobular pneumonia is much more common. The disease progresses and death is the consequence. Bouchut adds these aphorisms :

1. A moderate fever, combined with an ordinary cough, announces an acute bronchitis without danger.
2. An acute fever, complicated with cough and panting, indicates a very serious acute bronchitis, about to transform itself into lobular pneumonia.
3. The chronic cough of children leads to granular or tubercular phthisis.

Treatment.— The principal remedies I have found chiefly indicated have been *Aconite*, *Hepar*, *Tart. em.*, and *Ipecac.*

In *Aconite* cases the fever runs very high ; hot skin ; much distress and great restlessness. When these symptoms are present at the commencement of an attack of bronchitis, *Aconite* will sometimes cut it short.

Arnica.—The child cries every time it coughs, or even before coughing as if it dreaded it.

Arsenicum.— When there is great prostration; restlessness after midnight; it drinks little and often; suffocative attacks.

Belladonna.— The mucous rales are large and crepitous, hoarse cough; much moaning; moaning at every breath; starting and jerking of the muscles, worse on lying down.

Bryonia.— Respiration much oppressed; dry, cracked lips; cough worse after drinking; constipation of dry, black burnt-like looking stools. Every motion seemingly aggravates the suffering.

Calcarea carb.— Much mucus in the chest. In leucophlegmatic children; large and open fontanelles; much perspiration on the head, so that the pillow is wet far around.

Chamomilla.— The child is very cross and fretful; one cheek red, the other pale; must be carried to be appeased.

Cina.— Intestinal irritation manifest by picking the nose; nothing satisfies the child; it is always hungry.

Drosera.— The fever and the cough — which is very hoarse — are worse after twelve at night. (*Ars.*)

Dulcamara.— The disease has been induced by cold, damp air. This remedy has disappointed us, better select according to the symptoms present.

Hepar.— The child seems croupy, decidedly so, and the phlegm is loose and choking. It chokes in the cough. Feverish towards night. Rattling breathing during sleep.

Ipecacuanha.— Much nausea and vomiting of mucus; the cough is strangling and suffocating, so much mucus seems to be accumulated in the bronchial tubes; it turns blue in the face. (*Tart. em.*)

Lycopodium.— There is much oppression of the chest, and fan-like motion of the alæ nasi. Worse from 4 to 8 P. M. Much flatulence.

Nux vomica.— The child is always worse atter four in the morning. Constipation; loss of appetite; the cough is very tight and dry, and is sometimes relieved by expectoration of a small quantity of mucus after much coughing — during convalescence.

Phosphorus.— Protracted cases. Severe and exhausting cough, which it dreads and avoids as long as possible. The case becomes worse in the evening and continues so during the night. The fever is often very high and the pulse very rapid, threatening lung destruction.

Pulsatilla.— The cough is very loose, and with all the fever there is little or no thirst. The child gets worse towards evening, and it has more difficulty of breathing when it lies on its side.

ea.— In children who have large bellies; perspiration about the head; of a scrofulous constitution. Vomits milk soon as eaten. Useful during convalescence.

Sulphur.— The child has papular eruptions, inclined to excoriation; much rattling of mucus in the chest; sleeps in very short naps, frequent awaking.

Tartar emetic.— Much thirst; wishes to drink little and often. When the child coughs there seems to be a large collection of mucus in the bronchial tubes, and it seems as if much would be expectorated but nothing comes up. It froths at the mouth while asleep.

In bronchitis it is very important that the child be properly fed as the digestive organs are easily deranged. Infantile, easily digested, nutritious, food should be selected. Milk should be partaken of sparingly.

FOREIGN BODIES IN THE AIR PASSAGES.

These may have an origin external to the economy, in that case consisting of buttons, beads, fruit stones, or indeed, almost any small substance that a child may put in its mouth; or they may come from some internal source, being then usually lumbrical worms, blood or pus from abscesses in the neck or pharynx, or cheesy masses detached from tubercular disease in the lungs or bronchial glands.

Symptoms.— These will vary according to the nature of the foreign body, according as it is fluid or solid, hard or soft, round or angular, large or small, etc., giving rise to more or less distress, in difficulty of breathing and paroxysms of coughing. A sharp, angular substance may become fixed in the larynx, or in a bronchus and producing more or less complete obstruction of an air passage, leading to serious symptoms; while a round substance, moving up and down with the respirations or with the cough, may produce but little disturbance. In the former case ulceration and suppuration are likely results leading sometimes to perforation of the air passages and wandering of the foreign body. Emphysema with rupture of lung-tissue atelectasis and pneumonia, frequently lead to a fatal issue in cases where any foreign body has gained admission to the air passages. In one very interesting case of a child on whom tracheotomy had been performed on account of croup, Steiner found a lumbrical worm several inches long in the trachea and bronchus, and the lung tissue in the immediate neighborhood of the bronchus was in a state of pneumonia infiltration. If the foreign body be not removed death occurs this disease, the pneumonia of young infants is evidently the result of a stagnation of blood in their lungs. Under these circumstances, this blood may be regarded as a kind of foreign body, and it concurs in producing an alteration in the pulmonary tissue with which it combines, and is identified with it so as to form what is called a hepatization of the lungs. In proof of this, it is known that pneumonia almost always follows congestion or engorgement of the lungs, and as this engorgement is more frequent in the right lung than in the left, and at the posterior border of the lungs than in any other part of the organ, pneumonia appears much more frequently in the right than left lung. This was especially so with respect to the children whom Billard examined at the Hospice des Enfans Trouves, who were always placed at rest on the right side. It would therefore appear that inflammation of the lungs which produces hepatization, arises, in infants in general, from some mechanical or physical cause, whilst this is not the case in adults; besides, the inflammation of the lungs is ordinarily very circumscribed, and is found almost always confined to a point primarily engorged, and the pleura, which, in the greatest number of instances, is inflamed at the same time with the lungs, at a more advanced age, is not affected in young infants.

The inflammation, once developed, may give rise to various alterations of tissue, the shades and different degrees of which vary from simple hepatization to a great disorganization of parts. It is of common occurrence in the course of other diseases attacking children, either as a general complication or as a consequence of bronchitis or of pulmonary tubercles. This constitutes *secondary* or *consecutive* pneumonia. Pneumonia has been divided into lobar or general and lobular or partial.

Lobar or croupous pneumonia with the exception of the metastopyæmic form, occurring in lying-in and foundling hospitals is remarkably rare in the nursling, but wherever it does occur it displays the same morbid alterations as in the adult. Here also we have a *red* and *gray* hepatization, according to the time of the occurrence of death. The exudation is not poured out between the pulmonary alveoli nor into their walls, but into the cavities themselves, filling them up completely, and having the properties of purely croupous exudation. The red hepatized lung does not collapse on opening the thorax; it is totally emptied of air, the cut surfaces are dry and brownish-red, mostly uniformly granular, and such portions of the lungs are as friable as the parenchyma of the liver. The granular quality of the secretion is produced by the elastic fibres, lying between the alveoli, which are swollen by the deposit of firm exudation. The red color of the exudation is due to the interspersion of blood corpuscles.

The exudation, which with the exception of the blood corpuscles, primarily was amorphous, becomes quickly transformed into albuminous and mucolent masses; cells soon begin to form, which are produced alike from the alveolar walls and from the exudation. The blood corpuscles meanwhile are undergoing dissolution, their coloring-matter disappears, the entire mass changes its color, grows pale-gray hepatization—and the exudation constantly grows more like pus—purulent infiltration. Finally the contents of the alveoli dissolve to a milk-like consistency and then become absorbed. Occasionally, but rarely, large abscesses form, and still more rarely, complete obsolescence, hardening and induration of the pulmonary tissue takes place. In children lobar pneumonia never degenerates into tuberculous, as sometimes occurs in the adult, for tuberculous children generally succumb in the first few days afrer having acquired the croupous pneumonia. Lobar pneumonia is generally confined to one lung.

Lobular pneumonia is not a croupous but a catarrhal inflammation. Here small spots in the pulmonary parenchyma become diseased, which, although they sometimes aggregate nevertheless do not present the morbid appearance of the croupous, lobar pneumonia. Generally the disease involves both lungs, the right more than the left and the posterior parts of the lowest lobes are oftenest affected. Such lungs do not collapse completely, and this is not due so much to the lobular pneumonia as to the bronchial catarrh that constantly accompanies it, and when they are felt in different directions a few hard nodules will be found near their surface or deeply within them. If these nodules are divided, bluish-red, denser spots, without sharp circumscriptions, will be seen in the transverse section. The walls of the pulmonary air cells are intensely swollen, and when they are scraped with the scalpel, a reddish mucolent, but sparsely frothy secretion is obtained. The lobules affected with pneumonia seem to be somewhat beneath the level of the surface, on account of the pulmonary tissue surrounding them being mostly emphysematous, and their darker color makes them easily recognizable. If such places are carefully cut out, so that no normal pulmonary substance remains attached to them, they will sink completely in water and do not present the least trace of crepitation. But, by inflating the whole lung. they again become filled with air to a certain extent, in contradistinction to croupous pneumonia, in which inflation has no effect whatever; still these inflated lobules always retain a darker-red color and a perceptible hardness. The microscopical examination shows that the pulmonary vesicles are filled with large quantities of newly-formed epithelium cells and fluid exudation. We have here, therefore, no red and no gray, in fact no *hepatization* whatever, for which a firm, solid exudation is always necessary, and hence also no different stages. Even when lobular pneumonia become confluent, the lobules are nevertheless distinguishable from croupous, lobar pneumonia by the absence of friability, by the possibility of forcing air into them by inflation, by the greater moistness. and by the remaining free parts which at all times are interspersed between those affected. The process always remains catarrhal, never becomes of a croupous nature. When pneumonia is superficially located, there are exudations upon the pleura, and invariably bronchitis in the bronchi leading to the inflamed places. (Vogel).

Congestion of the lung occurs either in the lobular or lobar form, the distinction between the two being the same as that between lobular and diffused or lobar collapse. When lobular, the lung presents, generally along the posterior edge of the organ, disseminated lobules, distinctly circumscribed by the interlobular cellular septa, which are rather protuberant than depressed, more friable, and of a lighter purple color than collapsed lobules, and which afford when squeezed, a considerable quantity of frothless bloody fluid. In very young infants, the congestive disposition often assumes the lobar or diffused form, and is supposed by M. Legendre to have frequently been taken for pneumonia. In this variety of congestion, the affected portion of the lung is increased in size, and is distended and gorged with fluids. The color of the congested part varies from a light to a dark purple, or almost blackish tint. The cohesion of the lung is also variable, the differences depending on the degree of the congestion. When this latter is very great, the part is very friable, while it is much less so under the opposite condition of things. Though the lung is harder in this state than natural, it still retains a certain degree of flaccidity which does not exist in true hepatization. Pressure causes an abundant exudation of blood and serosity from a cut surface, and the latter, instead of being granulated, as is always the case in hepatization, is smooth and even. Neither does the lung exhibit any granulations when it is torn. Lastly, inflation distends all the vesicles, and gives to the condensed parts their natural lightness, and their rosy color, although the development of the affected parts under the operation is not complete and entire as in collapse, in consequence, no doubt, of the large amount of blood they contain. (Meigs & Pepper).

Chronic Pnemonia.—This alteration is very rare, and is always present in the lobar condition. It is characterized by a reddish-gray induration of the lung, which has lost its spongy character, and presents the smooth and fleshy aspect of carnification collapse. This tissue is very hard, and impermeable to air except by insufflation, it is almost entirely composed of an amorphous homogenous substance interposed among the elements of the lung, sprinkled with the granular bodies of inflammation, and with numerous elements of fibro-plastic tissue. It often encloses in addition miliary granulations, semi-transparent and very small which may be taken for tubercular granulations, and which are formed of fibro-plastic elements, or of cells of pavement epithelium heaped one upon another. (Bouchut.)

Symptoms.—The symptoms of lobular and lobar pneumonia may be very properly described together, since all the signs with the exception of the sounds of the cough and those furnished by percussion, differ but little from each other.

In the following description, children under two years are referred to; children who have passed the first dentition seldom suffer from lobular pneumonia. They usually have lobar pneumonia, which differs in no respect from that of an adult. The physical diagnosis of infantile pneumonia is attended by great difficulties, and requires much patience and time. The children are invariably opposed to the examination and set up such a cry as to render all investigation impossible. Added to that the sputa are also entirely absent, and by their very absence demonstrate their importance in the confirmation of the diagnosis.

It is seldom possible to accurately establish the commencement of a *lobular* pneumonia, for a bronchial catarrh always precedes it for some time, and its transition into pneumonia takes place gradually. It is generally ushered in by a cough, without fever, which grows worse and worse; sooner or later fever supervenes, the temperature of the skin constantly rising higher, and if there is no change in a few days, the whole train of symptoms of pneumonia is fully
(Vogel,) These symptoms last from twenty-four to forty-e
If they disappear, or if they only remain stationary, the

merely a catarrh which has affected some of the bronchi; if they increase, lobular pneumonia is evidently setting in. The child then becomes restless, sometimes much agitated, discontented at everything, even at the sight of its nurse's breast. The appetite is not disturbed, it does not vomit and has no diarrhœa. The skin, moderately warm, becomes burning at regular intervals. The pulse is accelerated in proportion to the development of the heat, and becomes burning at regular intervals. The pulse is accelerated in proportion to the development of the heat. and becomes uncommonly rapid, and may rise to two hundred beats per minute. (Bouchut.)

The cough is dry, short and hacking at first, and not very frequent, but it soon becomes louder, fuller, more straining and especially it becomes painful. This latter fact may always be ascertained by watching the motions of the child, its cry, and the expression of its face. There is always a disposition to restrain the cough, to smother it, or a struggle to make it short and sudden, when it causes sharp pain. At the moment of cough there is a marked expression of pain, a kind of sudden grimace or twisting of the features, accompanied or followed by a loud sharp cry or a spell of crying. The cough sometimes presents itself under the form of fits, but without the hoop as in hooping cough. (Meigs & Pepper.) When it becomes violent and paroxysmal, little white foam appears between the lips even in the youngest children. The cry of children suffering from pneumonia is characteristic, it is never very loud and still less continuous; it should rather be called abruptly interrupted moans and groans.

The most striking symptom is great acceleration of the breathing, which may rise to sixty or eighty per minute and have an inverse rhythm. While in health the accent lies upon the inspiration in pneumonia, the accent falls upon the expiration, which is accompanied by a louder noise than the inspiration. The most energetic contractions of the diaphragm are now seen. At every respiratory act the intercostal spaces sink, producing a momentary depression beneath the nipples, extending toward the sternum. In a higher grade of pneumonia, the facial muscles also participate. the alæ nasi rise, a phenomena upon which too much attention cannot be bestowed, the mouth is opened, the angles of the mouth are drawn downward and outward, indicative of suffering, and the eyes glassy, staring or anxiously rolling about. (Vogel.) This condition is perfectly expressed by the term "panting" respiration. But the retraction of the lips is one of bad augury, as it is only observed in the last moments of existence.

These exterior disorders are very well evinced upon the physiognomy of the child, without it being necessary to undress it. The paleness of the face, the movements of the nostrils, the noise that the mouth makes in the expiratory respiration are sufficient in a child at the east, to constitute the diagnosis of pneumonia. (Bouchut.) As a general rule the bowels are torpid, while vomiting which is rather unusual in older children, is quite common in young infants.

It sometimes happens that the *sympathetic disturbances of the stomach and bowels* is so considerable as to obscure the chest symptoms, and the case is taken for one of enteritis; or perhaps, if the heat of the skin and sensorial disturbance are considerable, for what is loosely termed "remittent fever;" and this latter error is especially likely to be committed if the upper lobes of the lung are the seat of the inflammation. (West.)

In most cases of *lobar or croupous* pneumonia, the fever begins suddenly, even before the symptoms of disturbed respiration become apparent. On the following day the pneumonia comes on and assumes its cyclical course. The croupal cough is a misleading symptom, confounding it with croup. The consecutive cerebral symptoms do not depend upon the extent of the pulmonary affection, but upon the individual irritability. There are children who, in the most violent lobar pneumonia retain a free sensorium, and others, again, who in the slightest ailment are attacked by all sorts of convulsions and nervous phenomena. The course is extremely rapid in lobar pneumonia, for death or improvement ensues in from six to eight days. In young children the fatal termination is more frequent than recovery. Children over two years of age bear lobar pneumonia as well as adults. (Vogel.) Occasionally between the second and fifth day, an eruption of congestive erythema may occur, especially on the trunk, and sometimes to a considerable extent, which, in connection with the high temperature, may be mistaken for an attack of scarlet fever. Its true character is readily determined by its transience, and the absence of desquamation. The occurrence of herpes facialis in children suffering from pneumonia is frequent, its general seat being the lips, more rarely on the forehead, cheeks or ears.

One form of croupous pneumonia differing in its course from the usual character of the disease in its severe cerebral symptoms, and peculiar to children, has been described as cerebral pneumonia. It possesses more the character of a meningitis than a pneumonia, and two varieties of it have been defined—the eclamptic and the meninfrom pneumonia by its feverless course, and by the diminished vocal fremitus. (Steiner.) A due caution should be observed not to overlook the *pneumonia* which sometimes comes on *in children while teething*. Its early symptoms may fail to excite apprehension since they are apt to be regarded as the result of that sympathetic irritation of the air tubes, which so often accompanies dentition, and the time for action allowed to pass unemployed. The disease comes on in weakly children, is unattended by much constitutional reaction, and often runs a somewhat chronic course, while its nature is further obscured by the tendency to diarrhœa which exists during dentition, and which is now excited by the thoracic affection. This diarrhœa often becomes the most striking symptom, and all means are employed to suppress it, and to check the vomiting which generally attends it. These efforts are unavailing; the child wastes daily and its skin hangs in wrinkles about its attenuated limbs, while the abdomen becomes tumid from the collection of flatus in the large intestines, and tender on pressure, and the tongue grows red, dry and chapped, or covered with aphthous ulcers. The cough now perhaps attracts notice; but both it and the bronchial breathing in the lungs are probably looked on as indications of phthisis. At last the child is worn out and dies, but no tubercles is found in any part of the body, no disease in the intestines, but pneumonia with purulent infiltration in both lungs, a disease which ought to have been detected and which probably might have been cured. (West.)

Prognosis.—In croupous (lobar) pneumonia the mortality is very low. The previous health, the elevation of temperature and the extent of tissue involved modify the prognosis. A high temperature on the seventh and ninth day is of bad omen. Meningitis or pericarditis is a bad complication. Lobular or catarrhal pneumonia setting in as it usually does as a secondary disease of measles, hooping cough, or bronchitis is a more grave form. It is more favorable after measles than hooping cough. In weakly children it is unfavorable. The younger the child the more serious the case. The extent of the bronchial inflammation, the more serious it is from the defective aeration.

When the pulse is small and soft there is constantly rattling, and little or no cough are symptoms that precede dissolution. Convulsions here are followed by death.

The treatment of pneumonia is easy when the disease is recognized. The remedies are few and their symptoms clearly defined. The convalesence may be tedious and must be managed skillfully.

Aconite is the prominent remedy if the child has truly a synochial fever, is very restless, with much oppression of the chest and anxiety. It can scarcely cough, the suffering is so intense. Short and rattling breathing; constant cough; almost constant crying, with anxious countenance and great uneasiness.

Arsenicum is sometimes indicated during convalescence when there is restlessness, thirst for sips of water, and no appetite.

Belladonna.—Face very red and eyes injected. The child moans with every breath. Its skin imparts a burning sensation to the hand. Jerking and twitching of the muscles. Cannot bear to be laid down must be held or sit erect. Frequently indicated in small active children. The attack and cough are sudden. Cries after coughing.

Bryonia.—The child cannot bear to be moved, the least movement so greatly increases its sufferings. Dry and parched lips; mouth dry; constipation; fæces hard and dry as if burnt, usually of a dark color; the cough is aggravated by drinking, but the child nevertheless wishes to drink large quantities of water. Croupous form.

Calcarea.—Should also be studied in very fat children especially. Compare indications under Croup, Atelectasis, Bronchitis, and Hooping Cough.

Ipecac follows *Bry.* well. Loose cough; nausea. Child gags at everything.

Hepar.—Loose cough; when the fever is broken. Child very peevish. Follows *Aconite*, *Bell.* or *Bryonia* well in catarrhal cases.

Kali bich. or *carb.* may be indicated in the croupous form as in croup proper.

Lycopodium.—Decided flapping or fan-like motion of the alæ nasi; they dilate widely and extremely, and then contract, alternately. Bad cases. Flatulence and much disturbance of the digestive organs. Compare *Sulphur.*

Mercurius.—Much fever; thirst; salivation; *a profuse perspiration* which affords no relief, a great deal of coughing with great distress.

Phosphorus.—Particularly in tall and slender children; violent cough sounding dry or loose; panting respiration; hoarse towards evening. Protracted cases.

Sulphur.—In cases attended with pustular eruption; skin rough and scaly, and other indications for this remedy. Tedious cases; fever at night with dry cough, loose in the day.

Tartar emetic.—Loose rattling cough; much mucus. Frothing at the mouth while asleep. Catarrhal form.

Teste's treatment is first *Chelidonium*, *Pulsatilla*, then *Spongia*.

HOOPING COUGH. PERTUSSIS. TUSSIS FERINA. TUSSIS CONVULSIVA. CHIN COUGH.

Hooping cough is an epidemic, contagious, bronchial catarrh, characterized by a hard convulsive cough, returning in frequent and more or less prolonged paroxysms, and followed by long, shrill, and laborious inspirations, called the hoop. The attacks of cough are terminated by the expectoration of tough mucus and often by vomiting. The disease is usually protective against a second attack.

Hooping cough is met with nearly exclusively in children, from the period of birth to that of second dentition; infrequently it is met with in adults. The earliest age is not exempt from it. Bouchut mentions several cases occuring under one and two months, and Watson relates an instance in which the infant hooped the day it was born. Its termination is more often fatal than is generally supposed and according to English statistics it ranks fourth among the causes of death under five years of age. As long as the disease is uncomplicated—unmixed with inflammation, and therefore unattended with fever, or only with that slight inflammatory condition proper to mild catarrh—it is seldom a dangerous disease; nevertheless when it is very intense, the disorder may have a fatal issue, without any organic complication. Before the little patient has fairly rallied from one paroxysm, another succeeds it; the spasmodic closure of the larynx is more and more complete and lasting, until at length, little or no air can pass; the characteristic hoop becomes short and faint or ceases altogether; and the child dies of apnœa. Hooping cough is also in a great many cases, not simple—not uncomplicated. Bronchitis and pneumonia are undoubtedly the most frequent complications, and lobular pneumonia, so common among children at the breast, may justly be regarded as the cause of the fatal issue of hooping cough in most of the cases of death.

Anatomical Lesions.—Of the many anatomical lesions found, those only belong to the disease which indicate catarrh of the air passages. Of the numerous others, all are mere resulting complications, such as lobular and lobar pneumonia, dilatation of the bronchi, emphysema, chronic broncho-adenitis, tubercle of the glands and lungs, pleuritis, pericarditis, hydrocephalus, pulmonary and cerebral apoplexies.

Symptoms.— Hooping cough presents three stages, which, however, are not sharply distinguished but gradually and imperceptibly run into each other. These are the catarrhal, the convulsive, and the stage of decline or convalescence.

The first or *catarrhal stage* may last from a few days to several weeks. The symptoms are those of an ordinary catarrh, as frequent sneezing, running from the nose, lachrymation and reddening of the eyes, tickling in the throat, and a dry, frequent, irritating cough, which comes on especially towards evening and during the night, frequently hoarseness or even attacks of pseudo-croup, slight feverishness at night, slight delirium and general restlessness and malaise. This stage now passes into

The Second or Convulsive Stage.— The cough now assumes its peculiar, convulsive and paroxysmal character. It comes on in paroxysms, in which a number of the *ex*piratory motions belong to the act of coughing are made in rapid succession, and with much violence, without any intervening inspirations, till the little patient turns black in the face and seems on the point of being suffocated. Then one long-drawn act of *in*spiration takes place, attended with that peculiar crowing or hooping noise which denotes that the rima glottis is partially closed and which gives the disease its name. As soon as this protracted inspiration has been completed, the series of short expiratory coughs, repeated one after the other till nearly all the air appears to be expelled from the lungs, is renewed; and then a second sonorous back draught occurs; and this alternation of a number of expiratory coughs, with one shrill inspiration, goes on, until a quantity of glairy mucus is forced up from the lungs, or until the child vomits, or until expectoration and vomiting both take place at once. During the urgency of the paroxysm the face becomes swelled, and red or livid, the eyes start, the veins of the head and neck are much distended, the little sufferer stamps sometimes with impatience, and generally clings to the person who is nursing him for support, or lays hold of a chair or table, or of whatever object may be near him to diminish (it would seem) the shock or jar by which his whole frame is shaken. As soon as expectoration or vomiting have happened the paroxysm is over. The child may pant a little while, and appear fatigued; but commonly the relief is so complete, that he returns immediately to the amusements or the occupation which the fit of coughing had interrupted, and is as gay and lively as if nothing had been the matter with him. (Watson). In very severe cases there are other symptoms in addition to those just mentioned. Hæmorrhages from the mouth, ears, nose, lungs, beneath the conjunctiva and into the cellular tissue of the eyelids are not unusual. Bouchut has observed one case where the child shed bloody tears, and the same has occurred in the practice of Trousseau. Sometimes the urine and fecal matters escape involuntarily and occasionally, though rarely there is prolapsus of the rectum and also the formation or reappearance of hernia, and the convulsive state which appears confined to the organs of respiration may become generalized and give place to true convulsions. The number of paroxysms in the twenty-four hours varies from four to sixty, generally, however, not more than eighteen to twenty-four occur during that period. No regularity in the succession, nor equality in their intervals ever is to be observed. They are more violent and occur oftener in the evening and during the night. When several children affected with hooping cough are together, and one of them begins to cough, the mere sight will in most instances, infect the rest and soon all join in chorus. In some instances after the paroxysm is apparently over, the child will begin within a few instants to cough again, and may in this way have several fits in such rapid succession as to make an almost continuous paroxysm. In the interval of the fits of coughing, there is little or no fever, and the child preserves its appetite, spirits and strength, even when the attacks are frequent; however if the fits of coughing very quickly follow each other, the child appears pallid, weakened and remarkably depressed.

The third stage or stage of decline dates from the time when the disease is evidently on the decline. The paroxysms grow less frequent and less violent, the cough reassumes some of the catarrhal features which it had at first, and gradually loses its peculiar spasmodic character. The duration of this stage is uncertain, but where it has been stated to have lasted weeks or months it has evidently been due to the presence of some complication, as chronic dilatation of the bronchi, tubercular disease, etc. It happens not unfrequently, however, that after the disease has apparently ceased all the distinctive characters of the cough recur, if the child chance to take cold within a few weeks, or even longer after its disappearance. During this stage the hoop or "reprise" ceases entirely, and although retchings may still be present, no liquid food is vomited, the matter consisting of an enormous quantity of bronchial mucus. This mucus is mostly yellowish or greenish colored, and with every attack of coughing, nearly a tablespoonful is expectorated. About this time nocturnal perspiration becomes superadded in most of the children, and sometimes an eczema breaks out. It is said that tuberculous infiltration are not infrequently found to follow hooping cough, in cases where a marked predisposition to these conditions exists, and the tuberculous affection is most apt to take the form of pulmonary or bronchial phthisis. Other children suffer from gastric complications, have a coated tongue, anorexia, fever, suffer from general debility and the feces have a putrid smell.

Diagnosis.—The diagnosis of hooping cough is difficult only during the first stage of the complaint, but after it has once fairly entered upon the second stage, it is scarcely possible to confound it with any other malady. Hooping cough might perhaps be confounded with a variety of bronchitis, in which the cough also comes on in distressing fits with more or less interval. But in this variety of bronchitis the cough differs from hooping cough, and has not the *noisy sonorous hoop* in the inspiration; the febrile state is well characterized, which is only very seldom observed in hooping cough; there are no *vomitings* at the termination of the fit of coughing, and there is scarcely any expectoration. The diseases with which hooping cough may be confounded are: bronchitis and bronchial catarrh when accompanied by spasmodic cough, and tuberculosis of the bronchial glands, in which the same cough is present.

DIFFERENTIAL DIAGNOSIS.

Hooping-cough.	*Acute bronchitis with spasmodic cough.*
Commences with catarrh.	Often commences suddenly with cough.
Fits of cough terminating with whistling inspiration, tenacious expectorations and vomiting.	Fits of coughing less severe; no whistling inspiration, tenacious expectoration, no vomiting.
No fever in complicated cases.	Much fever at the commencement.
Respiration natural; the normal respiratory murmur being heard in the interval between the fits of coughing.	Different rales in the chest.
Only occurs once in the same subject.	May attack frequently.
Symptoms intermittent.	Symptoms continuous.
Expectoration.	No expectoration.

This absence of the expectoration in the catarrh of young children is, moreover, a curious fact and should be of assistance in the diagnosis of hooping cough in children at the breast. In fact this disease of early childhood is nearly the *only one* in which an abundant expectoration takes place.

Hooping-cough.	*Tuberculosis of the bronchial glands.*
A contagious and often epidemic disease.	Not contagious or epidemic.
Three distinct stages.	No distinct stages.
The fits of coughing prolonged, terminating with a whistling inspiration, tenacious expectoration and vomiting.	The fits of coughing very short and not terminating with whistling inspiration, expectoration or vomiting.
No general symptoms in uncomplicated cases.	Symptoms of hectic fever.

Prognosis.—Simple hooping cough is not a fatal disease, though it may become so through its complications and sequelæ. This refers especially to sucklings and to rickety, scrofulous children, or those already suffering from pulmonary affections for whom hooping cough has especial danger.

The *treatment* of hooping cough to be successful must require skill in the selection of the remedy. No disease if we except intermittent fever is more governed by the epidemic influence, hence the large number of specifics for it. The cough character for the year must be studied closely and the similar remedy selected. In the early stage of the disease, this will be apt to abort it. Later the stages of the development of the disease must decide the choice.

Teste in his positive way says: *Ipecac*, *Dulcamara*, *Belladonna*, *Cuprum*, *Drosera*, *Ambra*, *Arnica*, etc., have been recommended for hooping cough. Now, with the exception, perhaps, of *Belladonna*, and *Drosera*, none of these remedies have a direct influence upon this disease. But there are in our materia medica two substances which control the therapeutics of hooping cough, *e. g.*, *Corallium rubra* and *Chelidonium majus.*

Corallium rubra.—From the moment that the coughing fits have assumed the convulsive form, and even before that time, that is to say, during the catarrhal period, as soon, in a word, as one is sure of having to deal with a hooping cough instead of simple bronchitis, he immediately prescribes the 30th dilution, for three or four days in succession, four doses in the twenty-four hours. "*It is like water thrown upon fire*," said one of his patients one day after Teste had given him this medicine for attacks of a convulsive cough which had passed into a chronic state. Other indications are violent spasmodic cough, "firing minute guns all day," towards night increasing to half an hour attack of violent spasmodic cough.

Chelidonium.—As soon as the amelioration produced by *Corallium* ceases, that is to say, at the end of four or five days at the most, it should be discontinued, and *Chelidonium* administered, of the sixth dilution, three doses in twenty-four hours, and continued unless there is a renewal of the violent spasmodic coughing-fits or convulsions in little children, or spasm of the glottis (all of which circumstances would call for a return to *Corallia*) until the evident transformation of hooping cough into simple bronchitis. When a very loose rattling cough remains a long time and does not improve. At this period

These symptoms, if recent, will yield to *Dulcamara* 12; if they should have lasted awhile, other remedies will have to be used with the *Dulcamara* which is still indicated. The *Dulcamara* makes the cough loose, removes the hoarseness. and as a consequence, the oppression of the chest, and diminishes the nocturnal exacerbations.

Pulsatilla, not too low, is another remedy which is frequently indicated in the catarrhal stage especially when the huskiness of the chest is accompanied by a constant desire to sneeze and a loose cough. *Pulsatilla* is especially serviceable when the precursory symptoms of hooping cough appear in connection with those of measles, or appear soon after the measle-symptoms pass off; the exacerbations generally take place in the evening, or in the first half of the night, are more distinguished by chilliness than heat, although there may be more heat than chilliness, which would not counter-indicate the *Pulsatilla*. Sometimes the mucous membrane of the whole intestinal canal is affected, and the loose cough may continue until the child vomits up a quantity of mucus, or else the catarrh of the chest may be accompanied by a slimy diarrhœa worse at night, which leads one to suspect a gastro-ataxia. In such a case *Puls.* will not fail to afford relief. Other remedies, such as *Ipecac*, *Chamomilla*, *Nux vomica*, etc., may likewise be suitable in this stage, but the symptoms differ.

Ipecac 6th for instance would deserve a preference, if the cough were excited by a sudden contraction or titillation of the larynx, extending deep into the chest and bordering upon a spasm, and on this account exciting the vomiting, the short, violent and concussive turns of cough follow each other in such rapid succession that it is impossible for the child to breathe, for each inspiration seems to excite another coughing spell. Strangling with the cough till blue in the face. Much mucus in the chest. Nausea and vomiting with the paroxysms.

Chamomilla 12th in the case of infants, corresponds to a dry cough, or wheezing rattling noise at every inspiration, as if the trachea were full of phlegm; it makes the children cross, they cry, and the children's anger keeps up the cough; at night this state of things is worse, the children have to be taken up a good deal and carried in order to appease them; this exposes them to taking cold, and the cold brings on diarrhœa and colic, which makes the children draw up their legs, kick with their feet, etc. One cheek red, the other pale.

Nux vomica is suitable for a hard, dry cough, causing a pain in the larynx; the cough is excited by a continual titillation in the throat, it lasts so long, that it racks the patient, becomes spasmodic, and finally induces retching, with anguish; the violent jarring is apt to induce a headache, and the children frequently hold their head with both hands, as if they would keep it from flying to pieces, or as if they would moderate the distress; face becomes blue, bleeds from nose and mouth; the symptoms are worse from 4 A. M., until morning. Child is constipated. A second dose of this powerful remedy is seldom required; the best time to give it is in the evening, unless the pressure of circumstances should render its exhibition at some other period necessary.

Squilla.—A medicine which is too often neglected by Homœopathic physicians, because its curative powers are less apparent than those of our polychrest medicines, and which is very useful in this stage, is the 15th or 18th. Independently of its known curative virtue in affections of the mucous membrane and glands, the catarrhal symptoms are frequently of such a nature as to require its use; internal chilliness with external heat, or vice versa, heat which is followed by chilliness on exposing one's self ever so little, and a hard tense pulse, are permanent symptoms in every catarrh, especially when it has fluent coryza accompanied by a good deal of sneezing and dimness of sight, with lachrymation. The child constantly rubs its eyes, nose and face with its fists during the cough. The selection of a drug, is after all, an inference of the reason, for the resemblance of the physiological symptoms to the phenomena of the natural disease is never perfect, were it only for this reason that the natural disease runs its full course with all its natural terminations, and that the drug disease is only a vague indistinct indication of the natural type. *Squilla* is certainly indicated by a loose cough with expectoration, preceded by a rattling in the air passages and accompanied by a distressing pressure under the sternum, and stitching pains in various parts of the chest. The catarrhal stage of hooping cough is frequently much more violent than a common catarrh, the accompanying fever has generally an erethic character, and sometimes rises to the rank of a synocha with pleuritic stitches. Under such circumstances *Squilla* is undoubtedly an appropriate remedy.

Belladonna.—The following symptoms call for *Belladonna*. When the cough seems to approach the spasmodic stage, and there is moreover stoppage of one nostril, with catarrhal discharge from the other, frequent nose bleed unto exhaustion, (*Arnica*, *China?*) nightly cough, principally with spasmodic constriction of the larynx, and ushered in by weeping. *Belladonna* is indicated when the brain is affected, and the cough is accompanied by spasmodic, and more particularly asthmatic symptoms. The child gets very red in the face with every coughing spell, or the cough has produced such congestion as to cause the sclerotic to appear extremely reddened. Characteristic indication for *Belladonna* are the peculiar little yellow ulcers at the tip of the tongue and around the mouth.

Carbo veg.—If neither of the above mentioned remedies should be able to prevent the irruption of the second or spasmodic stage *Carbo vegetabilis* 30th may yet be able in some cases to accomplish this. It is indicated by the following symptoms: The cough occurs principally in the evening or before midnight, it is dry, and when first setting in even somewhat spasmodic, frequently accompanied by coryza, hoarseness, rawness in the chest, feeling of adhesion in the chest almost resembling the cough in the catarrhal stage of measles, or even after it has run its course; or the cough is so violent and the irritation so constant that the patient has no relief until retching and vomiting have eased him. Great exhaustion after every coughing spell, with blueness of the skin, hot head and face. A cough with mucous expectoration, and painful pressure on the chest, resulting in vomiting of mucus, and followed by a stitching headache, is a proper indication for *Carbo veg*. The 24th to 30th attenuation is the most suitable.

In most cases the disease will run its course in spite of our treatment. The spasmodic character of the cough existing from the commencement, and the second stage is simply a more intense, a more marked and positive expression of the symptoms of the former. Sometimes the physician is not sent for until the second stage is fully developed. In either of these cases we may try one of the following remedies for the purpose of shortening the course of the disease.

Cina.—A very high potency. This is excellent when the cough seems to be complicated with scrofulosis, which may be inferred from abdominal affections, which either existed previous to the cough, or else developed themselves in consequence of it. It is likewise indicated by the symptoms, and more particularly when the phlegm in the larynx excites the cough in the morning, which returns at intervals of various durations; the cough generally commences with a spasmodic contraction of the throat, and continues for some time uninterruptedly with dyspnœa; after the cough a gurgling noise is heard from above downwards, whereupon the child gasps anxiously for breath, and turns pale in the face. If the child should be lying down, it raises itself previous to coughing, looks about with staring eyes, after which the body seems to become rigid, the child loses its consciousness, and it seems as though an epileptic fit would set in. The abdominal symptoms which accompany the attack, are of various kinds. Infants refuse the breast, larger children have ravenous canine hunger, rising of food, vomiting of mucus, flatulence, pricking at the nose, etc. If children should have worms, this would be an additional indication. Some pretend that the hooping cough is shortened by giving *Cina* and *Belladonna* in alternation.

Cuprum metallicum.—Obstinate hooping cough sometimes requires the use of several remedies for a cure, and in many cases we have to give *Cuprum met.* in the convulsive stage, sometimes in the beginning and at other times a little later. The chief indications for this medicine are: With every paroxysm, the child coughs itself into a cataleptic fit; it appears as if it were really dead. Much mucus rattling. Long continued paroxysms of suffocative cough. The child wishes cold water after every coughing spell, and seems to be relieved by drinking the water. Cough every half hour, or every hour and a half, it comes suddenly with stoppage of breath, the child becomes rigid, and sometimes appears like dead for a couple of minutes. Hartmann has seen the children throw themselves on the floor, when the cough was about to set in; as the spasm subsided a violent vomiting set in, with trembling of the limbs; the prostration yielded only gradually, and during the intervals the breathing remained oppressed, with a rattling noise in the bronchial tubes as if they were full of phlegm, the pulse was full and hurried. *Cuprum* will afford relief when the child seeks to cling to some firm object at the commencement of the paroxysm; the attacks are accompanied by convulsions, and spasmodic motions set in suddenly at night, the inner mouth is full of aphthæ, etc. Formerly Hartmann used to give the *Acetate of Copper* but more recently he has given the *Metallic copper*, a small dose of the 30th *attenuation*, and he does not repeat the medicine until the second or third day, if the anxiety and spasm should not have entirely disappeared. If this should be the case, and the paroxysms should be less frequent than they were *Cuprum* will cease to do much good, and some other remedy will have to be resorted to.

Conium maculatum.—There are some other medicines of an inferior rank in hooping cough, which may do good service under certain circumstances. *Conium* for instance, will diminish the violence a frequency of the nocturnal paroxysms; the cough is exceedingly violent, of a suffocative character accompanied by bloody expectoration, and flushed face. *Conium* is particularly suitable when the children are scrofulous or have had the measles. The 30th attenuation is the most suitable.

Veratrum album (24th or 30th.) This medicine is less valuable in hooping cough than *Conium*. It is true, *Veratrum* has cough with suffocative constriction of the larynx and vomiting, but it has not the characteristic wheezing inspiration. But it has other symptoms, which if they should occur during an attack of hooping cough, would raise the *Veratrum* to the rank of a specific. Such symptoms are: The paroxysms are excited by rising, and disappear on lying down; they are accompanied by spasmodic twitchings in the limbs by headache, vertigo, small hurried pulse, intense thirst and excessive debility. After every fit the child falls over exhausted, with cold sweat on the forehead, and disposition to hernial protrusions during cough etc.

It is impossible to mention all the remedies, which might be given for hooping cough; to do this it would be necessary that the character of the cough should be known beforehand. On a level with *Veratrum* we have *Mercurius*, *Ambra*, *Hyoscyamus*, *Lactuca*, *Laurocerasus*, *Kali carbonicum*, (recommended by Hering, Bœnninghausen, and found to be a specific in epidemic hooping cough characterized by a sacculated swelling of the upper lid,) *Silicea* and several others.

Silicea is excellent when worm symptoms are present, and when *Cina* does not answer.

This stage of the cough decreases gradually, although it may be considerably abridged by proper treatment, and we have now the last stage.

The Stage of Convalesence.—This stage is frequently neglected, and the little patients are apt to relapse into the spasmodic stage in consequence of exposure to changes of weather and temperature. Such relapses prolong the course of the malady to the great discomfort of the child.

The best remedies for this stage are undoubtedly *Hepar sulphuris* or *Sulphur*, 12th to 30th. *Hepar* is indicated by the extreme sensitiveness, irritability and susceptibility of the larynx to the effects of cool air, by a dry hoarse, or hollow croupy sounding cough, with constant oppression of breathing and choking, and occasionally exciting vomiting by febrile motions, especially chills along the back, flushed cheeks, hot palms of the hands and visible emaciation; symptoms worse towards morning; all these symptoms point to some hidden morbid disposition which no medicines will remove more effectually than *Hepar* and *Sulphur*.

Sulphur 30th, especially removes the sensitiveness of the larynx to damp and cold weather, when the cough again assumes a spasmodic form, it is a racking, almost suffocative cough, accompanied by retching and vomiting, a vibratory sensation and pain in the head, the voice is rough and hoarse between the paroxysms; the breathing is wheezing with weight and weakness of the chest; the children look languid, pale, worn out. *Sulphur* will always have a good effect when the patients have a scrofulous or rickety constitution, they are liable to take cold, and they are affected by every change of the weather. *Sulphur* is a specific in a sort of suppressed cough, dry and choking. Frequent relapses.

Other remedies may be indicated as follows:

Aconite.—If a constant febrile condition seems to prevail, or if the patient grasps at his throat with every cough, as if he were in pain. Cough dry whistling.

Ammon. bromide.—Almost constant cough, especially when lying down at night. (*Belladonna.*)

Arnica.—Every coughing spell is announced with crying; the child not only cries during the coughing spell but before its accession, as if in dread of it. Bloody expectoration.

Arsenicum.—When there is great prostration, with waxy paleness and coldness of the skin. Expectoration of frothy mucus, often accompanied with suffocative spells. The cough is excited by drinking.

Bryonia.—Dry spasmodic cough, worse after eating or drinking in the evening, with vomiting of the ingesta; cough excited by the slightest motion. Lips are dry and parched, and the child wishes to drink large quantities of water. Oppression of the chest with hoarseness.

Coccus cacti.—Every coughing spell is terminated by spitting large quantities of ropy mucus.

Ferrum.—Vomiting of the ingesta after every cough; not so profusely as in a *Bryonia* case, neither is there the parched lips and thirst but there is more pallor and weakness.

Hyoscyamus.—The cough is always worse as soon as the child lies down, and is relieved by sitting up.

Mephitis op.—In some forms of spasmodic cough this remedy specific.

Mercurius.—The child sweats very much at night, and bleeds at the nose and mouth at every coughing spell. Either by day only, or by night only, it has always *double coughing spells*, which are separated by intervals of perfect rest. Dry cough with watery coryza which excoriate the nose.

Naphthalin.—Excessive spasmodic cough; paroxysm lasting a long time.

Phosphorus.—Much hoarseness; almost total loss of voice from the effects of the cough. Cough causing headache; pain and difficulty of breathing; threatening inflammation of the lungs.

Sepia.—The cough is always much worse in the morning, when it is loose, and terminates in an effort to vomit or in real vomiting. This termination of a paroxysm is characteristic of *Sepia*.

Trifolium p.—Spasmodic, shaking cough; bronchial rales; asthmatic breathing with profuse stringy mucus. (*Kali bich.*)

Consult Croup, Laryngitis, Bronchitis, Pneumonia.

The dietetic regime of the patient is of some importance in this disease. During the catarrhal stage the temperature should be as uniform as possible, neither too hot nor too cold, so as neither to embarass nor unnecessarily excite the action of the skin, which, during this stage, is generally moist and should be kept so within natural limits. On this account it is advisable to keep the child in a room in order to protect it from the weather and exposure to cold. Spices and stimulating, heating drinks should be strictly avoided; light, 'and easily digested food is the best during the whole course of the disease. Stewed fruit, if not too sour, is allowable. The best drinks are an infusion of slippery elm, oatmeal gruel, barley gruel, rice water, etc. In the last stage the child may have broth, light meat, and suitable exercise in the open air. Tight clothes are to be forbidden. The child need not be kept in bed, but violent bodily exercise, vehement talking, laughing, crying, singing should be avoided least the paroxysms be excited. During the warm summer months the child may be taken out into the open air even during the second stage. A complete change of air is a popular expedient. Vaccination has cut short the attacks of this disease.

PLEURISY. PLEURITIS.

Pleurisy or inflammation of the investing membrane of the lungs is a disease which has received until comparatively lately much less attention than its importance deserves. Some writers on the diseases of children, indeed, have left it altogether unnoticed on account of its extreme rarity in early life; though this opinion is certainly erroneous so far as regards that secondary pleurisy which comes on in the course of pneumonia or in which the inflammation of the lung bears but a very small proportion to that of the pleura is an uncommon affection during the first years of childhood; and that as a cause of death its rarity is extreme. But the rarity of this disease unquestionably diminishes after the first years of infancy are passed; while its importance as an occasional complication, a sequelæ of other affecttions, and more particularly of scarlet fever, and the frequent obscurity of its symptoms, are reasons for devoting to it more than a passing notice. (West.) Pleurisy may attack children *in utero*, who then as a rule perish or survive the delivery but a short time. In such instances the corresponding lung is also affected. The pleurisy is unilateral or bilateral, and is seen as a thick or thin, fibrinous, whitish, transparent layer, which sometimes is easily, and other times again with difficulty pulled off. The serous effusion is here insignificant, yellow and clear, and entirely different from the cachectic, never putrid and never strongly tinged with blood. (Vogel.) The idiopathic form is most apt to occur in vigorous and hearty subjects, while the chronic and cachectic forms attack those who are feeble or delicate, or who are the subjects of pulmonary inflammations, acute exanthemata or congenital syphilis.

Anatomical Lesions.—In fatal cases of pleurisy in childhood, the appearances found after death are precisely the same as are met with in the adult. Adhesions between the costal and pulmonary pleura, and between the different lobes of one or other lung, associated sometimes with very intense redness of parts of the membrane are hardly ever wanting, and in connection with them a small quantity of transparent serum, often of a reddish tint, is sometimes effused into the cavity of the chest. In other cases the effused matters are entirely solid, and both the surface of the lungs, and the interior of the thorax are coated with a distinct investment of lymph; or in addition to the deposit of lymph on the lung, fluid is poured out in the chest, no longer transparent serum, but either a sero-purulent fluid in which flakes of lymph are floating, or more rarely healthy pus. The most frequent complication of pleurisy is with inflammation of the lungs; besides which it occasionally happens, when the left pleura has been the seat of inflammation, that the disease extends from it to the pericardium, which on such occasions is found to be lined with lymph, partially adhering to the heart, and containing a sero-purulent fluid. (West.) In pleurisy the lung presents various alterations from its healthy condition. It is pressed backward toward its root to a greater or less extent. The tissue of the organ is found hard, not crepitating, impenetrable to the finger, and presenting a smooth surface when cut into, a state of things expressed by the term carnification, and which is a mechanical effect of pressure. When there is coincident hepatization of the lower lobe, it is less retracted and that portion in contact with the fluid is large, heavy, fleshy, rather hard, and yielding under pressure only a small quantity of blood. (Meigs & Pepper.)

Symptoms.—Every pleuritis begins with fever. The child becomes restless, sleepless, loses its appetite and suffers thirst. The most distinctive sign of fever is always an increase of the temperature of the skin over the entire body; whereas the frequency of the pulse, particularly in infants, deserves less consideration on account of its physiological fluctuations. Older children suffer also from a chill. (Vogel.) The main symptoms that attend the disease, as well as the physical signs of its existence are the same at all ages. There are, however, some circumstances peculiar to early life, which may serve to obscure the real nature of the affection. The history of a case of acute pleurisy in childhood, is generally something to this effect: A child previously in perfect health is suddenly attacked by pain referred to the chest, so severe as to occasion it to cry aloud; perhaps attacked at first by vomiting accompanied with fever, a rapid pulse, and hurried respiration, interrupted by frequent short cough, which evidently occasions pain, and which the child labors, though in vain, to suppress. After a few hours the severity of the pain subsides; but the fever, hurried respiration and cough continue, and the child, though usually it looks heavy and seems drowsy, yet becomes extremely restless at intervals, cries and struggles as if in pain, and violently resists any attempt to alter its position, since every movement brings on an exacerbation of its sufferings. The posture which it selects, varies much; sometimes its breath seems disturbed in any other than an upright posture; at other times it lies on its back, or on one side; but whatever be the position, any alteration of it appears to cause much distress, and in some to be resisted by the patient. (West.) In young children the pain can only be elicited by exercising an alternate pressure upon various parts of the thorax or by percussion. Pressure, or a blow upon a part freshly attacked by pleurisy always causes the child to utter a cry or moan of pain. Somewhat older children, two or three years of age, when questioned concerning the site of the pain, point to the præcordia, though there be no signs of disease there. To the statement of children under five or six years old, as to the locality of pain, no value can be attached. Generally it comes on simultaneously with the fever, but hardly ever is of long duration, exhibits very distinct remissions, and after four to six days often disappears entirely, even without any remedies having been employed. In general it may certainly be said that the fever and the pain progress pretty regularly together, still very frequent exceptions occur to this rule. The sudden recurrence of a pain that has been absent for several days, deserves particular consideration, especially if it is attended by fever, for it then indicates that the pleuritis is not simple, but a complicated one, and pulmonary tuberculosis may be stated to be the most frequent complications of, or rather cause for the appearance of such symptoms. The pain also exercises great influence upon the degree of the dyspnœa, which is at first much more aggravated by it than by the mechanical impediment, the effusion. As soon as the dullness becomes considerable, the effusion consequently having become greater, the pain in most instances vanishes altogether, and in its place the mechanical embarrasment, produced by the compression of the lungs, ensues. Why the pain is confined to one spot only, notwithstanding the great extent of the pleurisy, is difficult to explain. The most plausible explanation is that the inflammation in some part implicates the neurilemma of the intercostal nerves, and thus the circumscribed fixed pain, violently aggravated on pressure, is produced. (Vogel.) Cough exists in nearly all idiopathic cases, and generally from the onset, though sometimes not before the second or third day. Usually frequent and dry, it commonly retains these characters in acute cases for four or six days, and then diminishes rapidly. Sometimes it is painful and constrained, sometimes frequent, teasing and painful. There is generally no expectoration; if any, it consists of a small amount whitish, frothy, sero-mucous fluid. Respiration is usually accelerat but varies in *kind* and *number* according to the pain and fever. The more intense these two symptoms are the more rapid and superfically do the children breathe. On the other hand, the effusion, after the acute process has ceased, is seldom so bulky as to keep up a continuous acceleration of the respiration. In form the accelerated breathing is that of the expiratory, *i. e.*, the accent lies upon the expiratory sound. No actual dyspnœa is present, but the respirations are frequent and superficial, in order that the deeper and painful ones may be avoided. For the same reason the movements of the alæ nasi are also less marked than in parenchymatous disease of the lungs, or advanced tuberculosis. (Vogel.) Children at the breast do not suck at all, or only do so for short intervals. The skin is blanched, yellowish or even cyanotic when the effusion is great; and in the latter case or even when both pleuræ are affected, or when the effusion has taken place very rapidly, the cyanosis may become extremely marked and the action of the accessory muscles of respiration become exaggerated. The febrile symptoms are usually marked with some degree of severity the temperature varying from 98° to 104° F.; the pulse rises from 120 or 140, and in very young children to 180. The temperature curve has no typical variations, though nightly exacerbation are often observed. When the exudation is purulent there is a continuous and extremely high temperature. Headache is often present during the first few days in children over six years of age, and is sometimes very severe. Convulsions are said to occur sometimes at the onset in very young children. Bilious vomiting is remarked to occur in more than half the cases. The stools are generally regular, or there is some constipation. The tongue is usually moist, and sometimes covered with a coat of whitish fur; the abdomen is natural.

Physical examination shows that the respirations are exaggerated and shallow, with deficient expansion of the affected side, distension of the intercostal spaces and diminished vocal fremitus. At first, percussion yields a note only partially dull, but in the further course of the effusion it becomes completely dull with an increased sense of resistance on percussion. The vesicular murmur is either very much diminished in intensity, or disappears entirely, and is replaced by bronchial breathing which seems to be produced at a distance from the ear, and has not the same loudness as that heard in croupous pneumonia. At the line where the exudation and the normal lung tissue border, an exaggerated vesicular murmur is usually heard, or there may even be amphoric breathing. Friction sound is rarely heard in children and is never met with in its complete form. When in addition to the pleurisy, bronchitis or pneumonia is present, the symptoms peculiar to them make their identification easy. Limited pleuritic effusion is not easy of diagnosis, and presents no perfectly trustworthy signs.

In chronic pleurisy the physical signs may last for months or even years, and in such cases the children seldom breathe freely but suffer from dry cough, shortness of breath, palpitation of the heart and epistaxis. The color of the face is waxy white and transparent, and is only changed by a transient flush. Any catarrhal affection of the lungs becomes in them very serious, and there are nightly exacerbation of the fever with marked night sweats. When the greatest part of this exudation has become absorbed, there results a marked deformity of the chest walls from retraction of the affected side by which the ribs are drawn together and the spine becomes curved. In cases where the exudation perforates the walls of the chest, improvement follows the evacuation of the pus, though there usually remains a fistulous opening for a long time. If the perforation occurs into a bronchus the discharge is coughed up, or if into the œsophagus, it is evacuated by vomiting or at stool. (Steiner.)

The complications of pleuritis are numerous. First of all the various general diseases in the course of which pleurisy may become developed, are to be mentioned. Thus it occurs in scarlatina, measles, small-pox, typhoid fever, pyæmia and scorbutus. Pleurisy is most unfavorable and dangerous when it supervenes early on a general disease, while that occurring during convalesence comparatively often takes a favorable course. Pleurisy, as a result of pyæmia and scorbutus, is naturally and unexceptionably fatal. Pleurisy very often is a secondary disease of tuberculosis and pneumonia. In fact there is no peripheral morbid alteration of the pulmonary parenchyma in which the pleura does not participate. Pneumonia is to be differentiated by the presence of mucous and subcrepitant rales in both sides of the chest, bronchial respiration, bronchophony, and a considerable vibration of the thoracic parietes at the time of the cries. Pleurisy on the contrary is not accompanied by any rale, the respiration is feeble on one side only; here the souffle is first heard to which succeeds total absence of respiration, complete dullness, and the absence of all vibration at the time of the cries. (Bouchut.)

Prognosis.—In infancy this is generally more favorable than in later years, and in expressing an opinion, attention must be paid to the form of the inflammation, the age of the child, and the exciting cause. The primary forms of the disease admit of more favorable prognosis than the secondary. Acute secondary pleurisy, as it is observed in the course of acute exanthemata, of typhus fever and of tuberculosis, is incompariably more dangerous, and pyæmic pleuritis of the new born child is unexceptionally fatal. When the course of pleurisy is acute, recovery with rapid absorption may take place within a week or two; when it becomes chronic, the recovery may be either complete or incomplete.

Treatment.—The remedy that is chiefly indicated is *Bryonia.* Ruddock says:

" If administered early *Aconite* may alone be sufficient. If it does not quickly relieve, *Bryonia* will have to be substituted. A dose of the selected medicine should be given every hour or two hours according to the urgency of the case. As long as febrile symptoms continue, *Aconite* may be alternated with *Bryonia.* These remedies often suffice to cure the disease in a day or two; or, if given early and at short intervals, in a few hours."

Aconitum.—Much fever, dry cough, in the early stage before adhesion or effusion.

Bryonia.—Short, labored, anxious, *catching breathing*, performed almost entirely by the abdominal muscles; frequent *cough*, which *shakes* and *pains* the side, either dry or with expectoration of glairy mucus; weariness, irritability, and restlessness.

Sulphur.—During convalescence, and to *prevent relapses.*

Teste in his positive way says: *Spong. marin. tost.* and *Lachesis*, both at the thirtieth dilution, are the medicines which control the therapeutics of pleurisy. I should not know how to recommend too earnestly the employment of these two substances. They should be administered simultaneously; *Spongia* once in the morning; *Lachesis* once in the middle of the day and once in the evening. We may remark, by the way, that this treatment, which is also that of peritonitis, seems adapted to inflammation of all serous membranes, with or without effusion.

Consult also *Kali carb.* and *Chelidonium.*

The little patient should be kept perfectly quiet in bed, and *propped up* somewhat as directed under Pneumonia. The diet should be light—milk and water, thin gruel, plain food, arrowroot, and light broth; and frequent sips of cold water to quench thirst. In case of effusion into the pleura, as dry a diet as possible should be given, so that, by diminishing the quantity of fluid taken into the body, the blood is deprived of necessary liquid, and a stimulus is thus furnished to absorption. Poultices of hot linseed meal, frequently renewed, or wrung-out hot flannels, applied to the chest, generally afford much relief. A light flannel bandage round the chest or crossed over the shoulders moderates the pain by gently restraining the movements of the ribs. But the bandage must not be applied too tightly. When the pain is referred to the epigastrium, and attended with marked oppression of breathing, it is indicative of inflammation of the pleura overpowering the diaphragm; and the bandage just recommended should be applied over the abdomen so as to restrain somewhat the action of the diaphragm. When effusion has occurred, and there is no evidence of absorption taking place, the *Pneumatic Aspirator* should be employed to evacuate the pleural contents without delay, especially when there is much dyspnœa, and when the collection of fluid is large.

HYDROTHORAX.

In nurslings, serous effusions into the pleural sacs occur very infrequently; in older children, however, they are more frequently seen as the effects of certain diseased conditions. The fluid poured out is purely serous, yellow, albuminous, and the salts it contains exhibit the same quantitative proportions as those of the serum of the blood. On the pleura itself no morbid alterations are to be detected, if no pulmonary disease with mild pleuritis have preceded it.

The *prognosis* may be set down as most favorable after scarlatina, not very favorable after intermittent fever, and decidedly unfavorable, if not positively hopeless, after cardiac disease. (Vogel.)

Treatment.—The subjects always become so exhausted by their preceding sufferings that it seems absolutely necessary to pay the utmost attention to the nutrition. Nourishing broths, with yolk of egg and milk, should therefore be allowed them, and as much as they will consume.

Remedies are *Ammonium carb.*, *Apis*, *Arsenicum*, *Aurum*. *Æsclepias*, *Bryonia*, *Calcarea*, *Carbo vegetabilis*, *Digitalis*, *Dulcamara*, *Helleborus*, *Lachesis*, *Lycopodium*, *Laurocerasus*, *Mercurius*, *Sanguinaria*, *Senega*, *Spigelia*, *Squilla*. *Stannum*.

Compare Dropsy, Asthma and Pleurisy, etc.

ASTHMA.

Little is said in most of the works on diseases of children on asthma. We are chiefly indebted to West for this consideration of this disease.

Dr. Salter in his classical work on Asthma, states that in seventy-one out of 225 cases the disorder dated back to the first ten years of life, and in eleven of the number it came on under the age of one year. West's observation confirms his statement as to the frequency of the affection in early life; and recently Dr. Loschner of Prague and Politzer of Vienna, have called attention to its occurrence in infancy.

Symptoms.—The characters which it presents are much the same at all periods of childhood, and do not differ from those of spasmodic asthma in the adult. It is not an ordinary sequela of hooping cough even though that affection should have left the child with emphysematous lungs; but it is not unfrequently developed out of frequent attacks of bronchitis dating back even from very early infancy. In the majority of cases, however, its spasmodic character does not become so marked as to attract notice until the age of five or six, or even somewhat later, while many of the children in whom asthmatic symptoms then come on will be found to have previously been extremely liable to attacks of a half spasmodic cough, the *laryngite striduleuse* of French writers the laryngeal spasm by degrees diminishing as the disposition to spasm of the air tubes comes on. In other instances the asthma has succeeded to extensive eczema, and so marked is the connection between the two conditions. West has never known eczema to be very extensive and very long continued without a marked liability to asthma being associated with it. It cannot, however, be said that the two conditions always alternate, the asthma being worse when the cutaneous affection is better, but the radical cure of the eczema is usually followed, though often not till after the lapse of three or four years, by the cessation of the liability to asthma.

Ætiology.—Catching cold, which in other children would produce ordinary catarrh, seldom fails in children with a predisposition to it to be followed by an asthmatic seizure, though it often comes on independent of previous catarrh, constipation and indigestion (chronic gastritis) being two of its most frequent exciting causes. Suppressed eczema is often an exciting cause. When the asthmatic habit is once established, the attacks are apt to occur at all seasons of the year, though undoubtedly spring and autumn are the times of its greatest frequency, especially the former.

Prognosis.—If the attacks are not exceptionally severe and frequent, their tendency undoubtedly is to cease about or rather before puberty or from the age of twelve to fifteen years. The probability of this being the case depends very much on the success of the endeavors to stave off the attacks; but yet our prognosis may, on the whole, be a favorable one. When complications set in it may prove fatal.

Treatment.— The value of a change of location or climate is as great with the child as adult. West of London says: A sojourn for three or four years in a climate which suits the child, (and three times out of four, that climate will be found in a moderately sheltered seaside place, *with a sandy soil* such as Bournemouth) is not infrequently successful in entirely overcoming every disposition to asthma throughout the whole remainder of the patient's life. Patients changing from north Chicago, by the side of the lake, to the west side, have been relieved of asthma (humidum.) A limestone region seem to favor the development of asthma.

The range of remedies that have been used is large. At the head of the list stands *Ipecac* for the acute attacks of spasmodic asthma; if there is much rattling of mucus and the attacks increase toward evening, *Tart. em.;* if the paroxysms come on in the night, *Arsenicum;* if the child is waked out of sleep with suffocation, *Spongia;* if the paroxysms occur after sleep, *Lachesis;* if from suppressed ulcers or eruptions, *Sulphur* or *Arsenicum;* if from suppressed measles, *Bryonia, Pulsatilla, Rhus tox.;* if fits of anger provoke an attack, *Cham., Bry., Arsenicum, Staphysagria.* In chronic asthma *Sulphur* is a valuable remedy to restore tone to the irritated mucous membrane. *Hepar sulphur* if there is a tendency to attacks of loose cough. If complicated with organic affections of the heart *Kali carb.* would be indicated, unless the symptoms pointed more strongly to *Lachesis, Spongia, Lycopodium, Aurum met.*, or *Arsenicum.* Where death seems to threaten from the suffocative distress, and the blue countenance *Veratrum* or *Cuprum* will usually relieve). See also Hay Fever, Spasm of the Glottis.)

Besides changes of climate and remedies much can be done by a vigorous diet and attention to respiratory exercise in preventing a return of the attacks. Where there is a possibility of inheriting a tendency to a nervous spasmodic condition, the use of *Sulphur* and *Calc. phos.* during gestation may help prevent a hereditary predisposition. Cases that occur during winter months are usually due to bronchitis. Consult Bronchitis.

HICCOUGH.

Hiccough or singultus is often a distressing affection of infancy. It is a noise made by the sudden and involuntary contraction or spasm of the diaphragm, and the simultaneous contraction of the glottis, which arrests the air in the trachea.

Etiology.— It is usually due in infancy to indigestion, or wind in the stomach. It may arise from a very grave affection.

Prognosis.—It is usually a symptom of a mild disturbance, but sometimes is very persistent, wearing the child out by its tediousness.

If it sets in during the course of any severe disease it usually is a grave omen.

Treatment.—A little cold water sweetened has been found a prompt means for arresting hiccough, and is a popular domestic remedy. Nutmeg tea, (*Nux moschus*) is a popular remedy for this affection. When it is persistent, or recurs frequently it is an index that the system is not in a normal condition, and one of the following remedies should be selected to permanently remove the difficulty.

Belladonna.— Flushed face; red eyes, crying on account of pain from the cough.

China.—Red tongue, belching after nursing or feeding. Stomatitis materna.

Hyoscyamus.—Twitching and jerking of the limbs as an accompanying symptom.

Ignatia.—Frequent sighing as an attendant symptom.

Ipecacuanha.—Much and constant nausea with the hiccough.

Nux v.—Constipation attends or causes the hiccough.

Pulsatilla.—Hiccough occurring mostly at night.

PERIODICAL NOCTURNAL COUGH.

This is an extremely rare and peculiar disease. It is observed in perfectly healthy children, but oftener in those with hereditary tuberculosis, and usually attacks children from two to ten years of age.

Throughout the entire day, the child does not cough, sleeps tranquilly in the evening, and as a rule, wakes up only after midnight, crying violently and coughing. Generally, the cough is continuous and dry, not so paroxysmal as to give rise to dyspnœa as in hooping cough, but severe enough to prevent sleep for two or three hours every night. It is not accompanied by expectoration, and the character of the cough is best compared with that of an hysterical girl, who sometimes suffers from paroxysms of a purely spasmodic cough. This cough recurs every night, not precisely at, but about the same hour, every paroxysm lasting an equally long period, until finally the child, entirely exhausted, and breathing rapidly falls asleep, to wake no more till morning. Thus it goes on for weeks, and even months, the attacks finally becoming shorter and feebler, and ultimately ceasing entirely. The eruption of a tooth of the first or second dentition often forms the final act of this enigmatical disease. Vogel has met with it but three times; one child, both previously and subsequently to the attack, was perfectly well, but the other two were the progeny of tuberculous parents, and subsequently exhibited very distinctly the signs of progressive tuberculosis. Although the cough in the daytime ceases completely, and no sibilant rales whatever can be heard over the entire thorax, nevertheless during the whole day, the children are gloomy, morose and become anæmic. They have not a proper appetite and mostly suffer from cold feet.

The *treatment* of this peculiar nocturnal spasmodic cough, must be symptomatic purely. The choice would lie between *Sulphur*, *Arsenicum*, *Belladonna*, *Kali*, *Nux*, *Sepia*, *Cina*, *Spongia*. The symptoms correspond to those of fright from disturbed digestion. If the irritation of dentition is the cause, *Hepar* would be a valuable remedy. The child's diet must be regulated. It should have a light supper.

PULMONARY EMPHYSEMA.

The well known blubber-like emphysema of the lungs, from which adult patients acquire a barrel-like thorax, and suffer from displacement of the heart and diaphragm is scarcely ever seen in children; indeed this kind of rarefaction of the pulmonary tissue seems to be altogether absent in the infantile organism. On the other hand, a vesicular and interstitial emphysema is often found.

Symptoms and Course.—The breathing is labored; the peri-pneumonial furrow is present; the cardiac dulness is diminished, and the apex beat weakened; the pulse is small; the cutaneous veins distended and enlarged; the face somewhat swollen; and the skin pale or cyanotic. Percussion yields a full, clear and tympanitic note, and on auscultation the vesicular murmur is found to be weak; and if there be any catarrh of the bronchi present there will be piping or snoring rales. These signs, may, however, be marked more or less by the symptoms of the primary disease.

Treatment.— The emphysema can be affected only in an indirect way and to a limited extent by treatment, which must be directed against the primary disease, or against any complications that may arise. Thus should it arise in the course of hooping cough or bronchial catarrh, the treatment and precautions appropriate to these affections must be employed. (See also Asthma).

ŒDEMA PULMONUM. ŒDEMA OF THE LUNGS.

This disease consists of a serous infiltration more or less abundant in the pulmonary tissue; it is rarely a primary affection, but is more often a sequel of pneumonia or pleurisy, scarlet fever, etc.; it sometimes is a fatal termination of these diseases. Billard has found the lungs œdematous in the case of œdema or induration of the cellular tissue; they are in a state analogous to that of all other parts of the body.

Symptoms.— The predominating symptom is a marked dyspnœa, which rapidly becomes aggravated to such a degree as to actually endanger life by suffocation, and may terminate fatally in a few hours. When the children are already large enough, and when their strength allows them, they will raise themselves and sit upright in bed, in order to acquire the utmost dilation of the thorax possible. Small children while in the recumbent position are seized with severe fits of suffocation, rendering it necessary to raise them up immediately. The breathing is extremely rapidly, and rattling, and the voice grows low and indistinct. The cough is loose; older children produce also a little white foam at the mouth. The pulse is very small, but, as regards the number of beats, stand in no relation to the frequency of the respiration.

Treatment.— The two remedies that are chiefly indicated are ***Arsenicum*** and *Apis*. *Sulphur*, *Hepar*, *Hellebore*, etc., may be indicated in some cases.

HÆMORRHAGIA PULMONUM. HÆMOPTYSIS.

Three kinds of bleeding from the lungs are known to occur in the adult—either in the form of blood sputa for a long time, or the blood suddenly bursts out from the mouth and nose in a stream, or the patients sinks down in a state of unconsciousness, and, after he has regained his faculties is seized with coughing up of blood. In children, so far as I am aware, the second form only occurs, and is a complication of two very different conditions, hooping cough and tuberculosis.

The treatment of this hæmorrhage is included under Hooping Cough and Tuberculosis.

HÆMOPTOIC PULMONARY INFARCTION.

This morbid lesion of the lungs, first accurately described by Laennec, is not very unfrequently observed in the autopsies of children who have perished from purpura or pulmonary tuberculosis, and is even found in the new-born child, but in the latter it is generally complicated with pyæmia and the formation of emboli in the lungs.

The *treatment* for this frequent post mortem condition is not clear. *Arsenicum* might arrest it in purpura. In tuberculosis, *Phos.*, *Calc.*, *Sulph.* or *Hepar* would be thought of.

GANGRENE OF THE LUNGS.

Gangrene of the lungs is an exceedingly rare affection in children. It occurs after traumatic pneumonia, produced by foreign bodies, which, during a forced inspiration have found their way into the lungs, and in the malignant course of acute exanthemata, in noma, in abdominal typhus fever, in pyæmia, and, lastly, as an unfavorable termination of hæmoptoic infarction.

Symptoms.—The symptoms vary according to the cause of the gangrene. In typhus fever, in noma, and malignant measles, the general disease is so severe, and the susceptibility to the pain, at the same time, so diminished, that no subjective symptoms whatever, and only a few objective symptoms become noticeable, while traumatic gangrene begins with symptoms of pneumonia.

Treatment.—The timely use of *Arnica* in traumatic cases and *Arsenicum*, *Phos.*, *Secale*, etc., in the prostrating conditions, giving rise to gangrene, may cure or arrest it.

CARCINOMA OF THE LUNGS.

Carcinoma in general is an extremely rare affection in children, and that of the lungs in particular has been observed but a few times. In most instances carcinoma of the lungs is found in the cadaver, along with cancerous deposits in other organs in the form of white or grayish-red nodules of the most variable sizes. They are situated both in the deeper portions and upon the periphery of the lungs; they are flattened down when deposited close to the pleura, and, like cancer of the liver, become umbilicated in the centre. The symptoms observable during life are reduced to bronchitis and dyspnœa and are usually supplanted by those of carcinoma in other organs.

Treatment.—Such remedies as *Arsenicum*, *Lapis*, *Hydrastis*, *Carbo veg.*, etc., given for the main symptoms, may arrest the disease before a diagnosis is possible.

GENITO-URINARY DISEASES.

DISEASES OF THE GENITAL ORGANS.

GENITAL MALFORMATIONS.

Congenital Phymosis.—By this is understood a congenital lengthening, and at the same time tightening of the prepuce to such a degree that it is impossible to retract it over the glans penis. In little boys, a certain degree of this condition is to some extent physiological, and very rarely only can the foreskin be pulled back entirely so as to completely expose the glans; still as a rule it can be retracted so far as to allow the mouth of the urethra and adjacent parts to be inspected. If it is impossible in any manner to retract the foreksin sufficiently to expose the meatus, then the condition is congenital phymosis. Usually the effects of this are trifling, for the orifice in the foreskin is generally sufficiently open to allow the urine to flow off in a stream. The superfluity of the prepuce decreases with age, the apex of the glans at length becomes visible, and with the appearance of manhood the entire condition is relieved. The prepuce may be, in some cases preternaturally long, and the orifice narrow, so that micturition is painful and impeded, and the retained secretion of the glans gives rise to balanitis, ulceration and even adhesion of the two opposing mucous surfaces.

If the constriction is allowed to continue, the development of the penis seems to be arrested to some extent, especially of the glans compressed, as it is, by the constricting prepuce, and the collection of smegma, liable to putrefaction, often gives rise to inflammation with its consequences. Various reflex phenomena may be occasioned by phymosis.

Treatment.—Simple incision at the orifice or extending upwards, or even excision of a part of the foreskin (circumcision). Distension of the constricting part by sponge tents has been recommended. It should be remembered that troublesome hæmorrhage and erysipelas

BALANITIS. INFLAMMATION OF THE PREPUCE. BALANOPOSTHITIS.

When the smegma accumulates between the glans and prepuce it often undergoes chemical decomposition, becomes thin, greenish-yellow and causes inflammation of the glans and prepuce. It may also be induced by external injuries, constant handling of the prepuce, inattention to cleanliness, masturbation, lodgement of intestinal parasites, and eczema of the genitals. The prepuce is swollen and red and the most intense pains occur when an attempt is made to retract it; the glans is reddened, covered with puriform discharge and when exposed, small lumps of fetid cheesy matter are seen contained in the folds of the prepuce and behind the glans. Attention to cleanliness and the use of cosmoline will entirely relieve these cases in a few days.

ACQUIRED PARAPHYMOSIS.

This results when a narrow prepuce is retracted over the glans either by design or accident, and retained there. The strangulation of the glans which ensues is often induced also by the application of pieces of thread, or wire or rings. The swollen and œdematous prepuce and the bluish-red distorted glans produce an alarming appearance. Micturition is painful, and at the point of strangulation there is some purulent discharge, especially if the strangulation be the result of some artificial constriction, and ulceration, or even necrosis and gangrene have taken place. Gangrene does not result, however, from simple constriction of the preputial border.

Treatment.—The glans may first be reduced in size by allowing a stream of cold water to flow over the organ, then grasping the œdematous prepuce between the two index and middle fingers, at the same time pressing the glans backward with both thumbs, first slightly oiling the corona.

PRURITIS OF THE VULVA.

This is common in little girls from one to three years old and is especially observed in feeble or lymphatic children, or in those born of parents themselves of feeble constitution. The pruritis is sometimes accompanied by leucorrhœa and appears to be occasioned by an altered and vitiated secretion of the mucous membrane of the vulva. The children incessantly scratch themselves, and may thus originate the habit of onanism.

Treatment.—The selection of the remedy will be between *Sulphur*, *Carbo*, *Sepia*, *Hepar*, *Silicea* and *Merc.* *Ambra*, *Calad.*. *Calc. carb.*, *Collin.*, *Con.*, *Helon.*, *Hydr.*, *Hydrocot.*, etc. Locally *Boracic acid* lotion will allay the irritation.

VULVAR HÆMORRHAGE. HÆMORRHAGIA VAGINÆ. BLEEDING FROM THE VAGINA.

In a new-born girl, or in girls a few days old, a slight vaginal hæmorrhage is observed in some rare cases. Usually the bleeding is insignificant, and a few drops only ooze out from between the labia during the day. Vaginal hæmorrhage never becomes profuse and as such is not dangerous. Billard has twice observed effusion of blood in the form of clots into the cavity of the uterus in little girls who had died after birth. Mallat, Camarer, Barrier and Ollivier d'Angers have observed similar cases. This hæmorrhage should not be mistaken for precocious menstruation, as it occurs once only.

GANGRENE OF THE VULVA.

This has never been observed in the newly-born child; it is very rare in the infant at the breast, and only becomes common at a more advanced period of childhood. It is the result of a general disposition under which the children are placed, and is brought on by an occasional irritant cause; masturbation, or the leucorrhœa, so frequent in the course of acute diseases, and especially of eruptive fevers. Erosions and ulcerations form on the internal surface of the greater and smaller labia, where gangrenous vesicles have formed and burst, and a white gangrenous ichor or purulent sanies is poured out. When the deeper structures of the labia are invaded these become œdematous, bluish or grayish-black, then black and the destruction extends from the great and small labia to the clitoris, the perineum as far as the anus, and the contiguous parts of the thighs and death follows after fearful disorganization. Besides the local destructions, catarrh of the mucous membrane of the air passages, and frequently also pyæmic emboli in the lungs, spleen, etc., are found in the cadaver. The remedies that are indicated are either *Arsenicum*, *Lachesis* or *Carbo an.*

CELLULAR ATRESIA OF THE VULVA.

Under this name Bokai describes a condition in which the labia minora are agglutinated throughout more or less of their extent, so that when the labia majora are separated the vestibulum vaginæ is not visible. It may be partial or complete and is analogous with the cellular adhesion between the prepuce and glans already mentioned, but is less common. It is apt to be detached spontaneously, especially where the atresia is incomplete. If there is any interference to the passage of urine, surgical relief must be given by rupturing the united edges with a probe, and dressing the parts with cosmoline to prevent reunion.

DIPHTHERITIC VULVO-VAGINITIS.

This may occur at any period of childhood and as a part of some general disease as diphtheria, scarlet fever, small pox, typhoid, etc. It may also occur primarily or secondarily to some other disease of the genitals. The exudation appears on the mucous membrane, and resembles what has already been described as occurring in the throat. As a rule it softens and disappears, though in severe cases it may pass into gangrene. The neighboring glands are often swollen and tender, and the ulceration which follows the disappearance of the exudation may extend to the external genitals and perineum. The general state of the system indicates a grave disease, the fever assumes a typhus character, the ichor finally emits a gangrenous odor, the false membranes and the subjacent tissues also become gangrenous, and death ensues in a few days from the commencement of the disease. In cases of recovery, if care be not taken, the opposing surfaces may become united; this should be guarded against by the insertion of pieces of oiled lint.

Treatment.— The same remedies will be indicated here as in Diphtheria proper as already given.

APHTHÆ OF THE VULVA.

This affection is often mistaken for chancroid. It is situated within the folds of the vulva, sometimes quite large in size, looking like an escar with a deeply inflamed border. Sometimes the inflammation involves the whole vulva and the patches be large and become hard as if gangrene was about to supervene. It is very important for the peace of the family and the reputation of the child that a correct diagnosis be made out. A suspicion of syphilis will be very disagreeable news to the already distressed parents. (vide Aphthæ and Noma of the mouth). Compare Diphtheria.

The *treatment* is *Merc.* and supporting diet and cleanliness of the parts. If the cachexia is marked. *Arsenicum* may be indicated.

INGUINAL HERNIA.

Inguinal or scrotal hernia mav be suspected if the child cries a great deal and has frequent green stools with great straining. The whole symptoms may be attributed to colic instead of the true cause.

This variety is either congenital or acquired. In the congenital variety, a portion of bowel descends with the testicles through the abdominal ring. This must take place sooner or later, if the upper orifices of the inguinal canal should remain open. The difference between the congenital and acquired variety is this, that, in congenital hernia, the protruded bowel and the testes are enclosed in the same sac, whereas in the acquired variety, the testicles are not contained in the hernial sac. The existence of this kind of hernia is inferred from the following symptoms: The inguinal region swells when the children cry, cough, press on the rectum, or are troubled by flatulence; when the testicle had prematurely descended into the scrotum; when the color of the swelling is the same as that of the rest of the skin, and when the reduction of the tumor by pressure is accompanied by a rumbling or gurgling noise.

Treatment.—In treating hernia whether congenital or acquired, we should not omit to inquire into the predisposing cause. If the coughing or crying of children were alone sufficient to induce hernia, it would exist much more frequently than it does. But for the same reason that hernia frequently occurs in after life without any apparent cause, it may take place in children, every part of whose organism, including the muscles and their constituents, is feeble and lacks firmness. This weakness is sometimes increased by hereditarv debility, and we know that a hereditary morbid disposition can be eradicated by treatment. This observation likewise applies to hernia.

"A real specific, not only for hernia but also for the chronic diathesis which leads to the formation of hernia, is *Acidum sulphuri-*

cum, the 15th, 24th, or 30th attenuation. When such a disposition exists, crying, coughing, flatulence, continual diarrhœic stools, may easily cause a rupture. Under such circumstances *Nux vomica*, *Aurum*, *Antimonium crudum*, *Sulphur*, *Lycopodium*, always in very high attenuations, are the remedies that will meet both the local disease and the constitutional psora. The accompanying symptoms have to decide the choice of the remedy, which on account of the vagueness of the symptoms, is sometimes rather difficult even for the most experienced practitioner. In such cases the temperament of the mother may assist us in deciding in favor of one or the other remedy; but, if this indication should likewise be wanting, we then have to make up our minds to give two remedies in alternation, a dose every twenty-four hours. The cure will not fail unless some strange untoward circumstance should prevent it." (Hartmann.)

Other remedies as *Cocculus*, *Magn. c.*, *Plumbum*, *Silicea*, and *Veratrum alb.*, may be indicated. We should not overlook *Bell.*, *Borax*, *Calc. c.* and *Nitric acid.* The totality of the symptoms should decide the choice. To keep the bowel up and thus aid the cure a truss should be worn. In infants a truss may be made of a heavy brass wire bent and looped at the end which can be covered with sealing wax and moulded to fit exactly. In older children an ordinary truss may be worn. A radical cure is effected by passing two wire sutures through the canal. This is often a serious operation and few surgeons commend it. With our remedies to control inflammation favorable results should follow.

INFANTILE LEUCORRHŒA. VULVO-VAGINAL CATARRH.

By these terms is understood such an augmented secretion by the vagina and vulva, that the discharge makes its appearance in drops upon the labia majora, and may flow down upon the perineum and thighs. A secondary redness and swelling are thereby produced, and in summer if the parts are not kept clean , will result in ulceration of the external genitals and adjacent parts.

Ætiology.—Leucorrhœa originates spontaneously, particularly in scrofulous and tuberculous children, living in damp houses. Local causes may be want of cleanliness, collection of the decomposed secretion of the sebaceous and mucous glands, mechanical irritation of foreign bodies in the vagina, the presence of ascarides, and the practice of masturbation. Infection with gonorrhœal virus sometimes produces it. An erroneous superstition exists among the lower classes, viz., that gonorrhœa of the male organ disappears when it is brought in contact with a hymen, and under this belief seductions are often committed. Such little girls manifest a shy feeling, and when questioned deny boldly or timidly answer in the negative with marked embarrassment. If condylomata are present there can be no doubt as to the nature of the case.

Symptoms.—The most prominent of these are a redding of an increased secretion from the genital mucous membrane. At first the discharge is thick, bright yellow, homogeneous, but subsequently, toward the end of the disease, or in scrofulous girls, from the beginning is viscid, mucolent, filamentous, poor in cells, and very much like the catarrhal mucus of the nose. This may be colored brownish from the blood of any ulcerations that have formed. There is generally pain of an itching burning character, especially during or after the passage of urine, excoriations of the mucous membrane, sometimes slight fever, and a sympathetic enlargement of the neighboring lymphatics. Older girls complain also of pain about the genitals, and walk, especially when excoriations are present, with outspread legs, in order to avoid friction as much as possible.

Prognosis.—The course of this disease is protracted in very scrofulous or tuberculous children. When gonorrhœal, it is quite severe at first, so much so that the child is unable to walk from the pain, swelling and excoriating discharge, and the leucorrhœa may persist for quite a length of time.

The *treatment* of infantile leucorrhœa does not differ essentially from that in the adult. It is, however, rarely uterine although the author has seen, on autopsy at the Home, cases where the uterus was involved, but in those cases the whole mucous membrane was diseased from inanition. In many cases *Calcarea* is a sufficient remedy. *Hepar*, *Hydrastis*, *Calc. phos.*, *Merc.*, *Pulsatilla*, *Arsenicum* and other remedies may be indicated by the general, as well as local symptoms.

If specific *Canth.* or *Cannabis* will be needed. Locally *Hydrastis* lotion (one drachm to *Glycerine* and water, two ounces each) has proved the most useful. When there is much chaffing, *Cosmoline* may be applied. If that irritates, dry starch will be a relief. If caused by ascarides the use of *Cina*, and oiling all the parts will usually afford relief. If caused by spinal irritation or inflammation of the bladder, these must receive the chief attention. If due to inanition consult Food.

INFLAMMATION OF THE MAMMÆ. MASTITIS.

Occasionally there is seen in either sex, a painful swelling of one or both breasts in young children, not confined to those who are weakly or badly nourished, and accompanied by the exudation of milky fluid from the nipples. This may last for a week or two and then usually disappears. In the breasts of most new-born children is contained a small quantity of thin milk, disappearing in the male child after a few days, but recurring in the female at her first pregnancy. The swelling must be idiopathic, or due to some injury, sometimes the fault of the nurse. It may end in resolution, or extend to suppuration and the formation of an abscess, or chronic induration of the tissues of the breast.

Toward puberty growing girls are often troubled by a painfulness of one or both breasts, which lasts only a short time and is significant of the general physiological change.

Treatment.—*Bryonia* is esteemed the chief remedy. *Belladonna* or *Hepar* may be needed if suppuration threatens. If due to a bruise *Arnica*. If the fever runs high, *Aconite*. Do not use anything locally except water unless suppuration threatens.

MASTURBATION.

This singular abnormal practice, though met with in girls, is far more common in boys. In the latter, precocious erections are produced by rubbing the penis with the hand, while girls excite themselves by rubbing the clitoris with the finger, or by the insertion of a pencil, candle, etc., in the vagina. This precocious sexual excitement very frequently, though by no means invariably, induces a diminution of both bodily and mental vigor, the peculiar freshness of childhood disappears, the skin becomes blanched and wrinkled, the child is listless and easily tired, the gait is uncertain, the facial expression old, sensual and apathetic, the eyes dull, watery, evasive, and surrounded with a dark ring, especially on the lower lid, and the nostrils dilating. The penis will be found to be disproportionately developed, and its prepuce very movable. In girls the vulva will be found gaping, the clitoris swollen and reddened, the nymphæ hyper trophied, and the hymen very often ruptured.

The most frequent cause of this vice is mixing with children already addicted to it. Nurses of loose morals who sleep with their young charges are also to blame; collections of smegma behind the glans, the presence of worms, (ascarides) that have wandered from the rectum, chronic eczema or other chronic eruptions on the genitals, spinal irritation, all exert a causative influence. Predisposing causes are the use of feather beds, too strong diet, especially hearty meat suppers. etc.

Treatment.—Corporal punishment is sometimes recommended as moral lectures fail in their purpose. The act may be made painful by circumcision in boys, and the occasional cauterization of the nymphæ or small incisions in the clitoris, in girls. During sleep the child's hands should not be allowed to remain under the bed clothes, and when going to the closet not allowed to remain there long. Children who are known to masturbate should not be allowed to remain in an institution where they may corrupt others. Grauvogl says, p. 127: "No physician will succeed in curing them as long as they remain curable at all, without *Platina*." He relates a case of a boy aged eleven, who acted like an imbecile, and was constantly trying to irritate the genitalia. He gave *Platina* 30, four or five drops night and morning for eight days, then skipped eight days, then repeated, and in four months cured the case. Masturbation, like seminal emissions and nocturnal enuresis, is often due to spinal irritation, and in that case the nervous system should receive our first attention. Consult *Plumbum*, *Causticum*, *Gelsemium*, *Cimicifuga*. Jahr says: If the sexual excitement is more of a moral than physical nature, attended with lacivious fancies and desires, I have so far derived the most benefit from *Carbo veg.*, *China*, *Calc.*, *Lyc.* and *Natrum mur.*, and sometimes from *Verat. alb.* and *Hyoscyamus*, and if the sexual organs are more or less relaxed, from *Lyc.* and *Calc.* If the excitement is more of a physical nature, with erections and excitement of the parts, *Nux*, *Phos.*, *Natrum mur.*, *Sulph. and Platina* (even in men) have so far proved most efficient in my hands; even *Aurum* has been very serviceable to me in such cases. The consequences of onanism, provided the patient abandon the vile habit, yield mostly to *Nux*, *Sulph*, and *Calc.*, and if (in larger boys) nocturnal emissions remain which do not yield to *Sulph.* and *Calc.*, the best remedies are *Phos. acid.*, *Conium*, and *Sepia*. To ensure physical and mental development, *Calc. phos.* 3x trit. should be given once a day for some time.

DISEASES OF THE KIDNEYS.

The urinary organs and their diseases in children deserve more attention than they have usually received by pædologists. We have seen how they are developed, now we will examine their construction and diseases.

The kidneys consist of two glandular organs, (designed to secrete the urine) and a system of excretory passages made up of *the ureters* which terminate in a common reservoir, *the bladder* and *the urethra*, by which the fluid is eventually carried off from the latter. The kidney, a bean-shaped organ with a smooth surface, is covered by a thin, but strong, fibrous envelop, the tunica propria, which is continued on to the external surface of the infundibula at the hilus, where the ureter leaves the gland, and its nutrient blood vessels enter. The substance of the kidney presents for consideration two portions, namely the *cortical* or external, which is of a brownish-red color, an indistinct structure to the naked eye, and an internal, paler medullary portion of fibrous appearance. The latter is marked by fine lines converging toward the hilus, and consists in most mammals of a single conoid mass with the apex toward the hilus, but in the human being this is divided into ten to fifteen sections, whose bases lie toward the cortical part of the organ, their apices being directed toward the hilus. To these the name *Malpigean* or *medullary pyramids* has been given. Between them the cortical substance is prolonged inwards in the form of septa, known as the *columnæ* Bertini, while both portions of the organ contains interstitial sustentacular connective tissue. Notwithstanding their want of similarity in appearance, both portions of the kidney consist of glandular elements resembling each other in many particulars. These are long branching canals or tubes, known as the uriniferous tubes of Bellini (or Ferreini.) In the medullary part of the organ however, they pursue a straight course diverging slightly or running nearly parallel, and dividing at very acute angles; while on their arrival in the cortex they commence to turn and twist upon themselves, and intertwining one with another, terminate eventually in a blind dilatation which envelops a peculiar congeries of vessels. The difference of texture observed in both portions of the organ is thus explained. The medullary substance contains besides the well known straight tubes, with acute angled division, a series of finer canals arranged in loops whose convexities are directed toward the apex of the medullary pyramids, and which on arrival at the limits of the latter are continued backward into the cortex.

The *cortical substance* of the kidney presents fully as complex an arrangement as that of the medullary portion. In vertical section it is observed to consist of tubes twisting and intertwining in all directions; besides these it is traversed from within outwards by cylindrical bundles of about 0.2707-0. 3158 mm. in diameter, at regular and short intervals. These bundles or cords are made up of canals of different calibre, which in some instances become narrowed in their course outward, where they are lost in convolutions immediately under the surface, forming there a narrow stratum of convoluted tubes. This cortical stratum of convoluted elements, consequently is interrupted at intervals by the bundles of straight uriniferous tubes, in about the same way that a board is pierced by groups of closely standing nails driven through it.

The mass of convoluted tubes may be looked upon, taken as a whole as divided into a multitude of pyramidal blocks of these groups of straight passages, the bases of the blocks being directed toward the surface of the organ. These are called the *cortical pyramids*. Such a division, however, is artificial, as the so-called cortical pyramids run into one another with the greater part of their lateral surfaces.

Malformations.—The kidneys are never totally absent; even in the most incomplete abortions they may be detected in some form. One kidney only is to be found in some cases, in which condition Rokitansky makes a distinction between the single and simple. In the former a single kidney at the normal place, to the right or left side of the vertebral column, differing but little in shape from the ordinary kidney, while on the opposite side there is no trace of a gland. The simple kidney, on the other hand is an abnormal fusion of two kidneys, the most common form of which is the horse shoe kidney. In this case two separated glands of normal shape are united at the lower end by means of a flat bridge of renal substance. The more limited this connection becomes, the more distinct the form of the simple kidney appears. Finally, also the two hila fuse together, forming a single hilum on the anterior surface. The simple kidney is always situated lower in the abdomen than the normal gland, and as a rule, lies in the vicinity of the promontory of the sacrum, seldom like the simple kidney external to the median line. There may be an abnormal smallness of one kidney while the other is of normal size.

Various other minor derivations in form also occur, and in this connection it may be observed that the kidney of the new born child, in the normal state, has a slightly uneven surface, and is nearer spherical in form than in the adult, and tapers somewhat toward the upper end.

Changes at Birth.—At birth the mucous membrane of the urinary tract seems to undergo like the rest of this membrane in the new born a positive hyperæmia and inflammation, consequently suppression and retention of urine are frequent occurrences during the first days of infant life.

URIC ACID INFRACTION OR OBSTRUCTION IN THE NEW BORN.

Remembering the fact that the mucous membrane of this tract undergoes a marked hyperæmia at birth, also the fact that this system was active before birth, and the added fact that its function is increased from cold, we can easily understand how infraction from uric acid is a frequent occurrence, especially if the labor was a tedious one. Muscular effort increases the amount of uric acid in the urine.

Urinary infraction is met with in two-thirds of all the children who die before the tenth, and after the second day of life. It is rarely seen in still-born, and but seldom in children who have respired one day. On the other hand, however, it frequently exists longer than after the tenth day, and exceptionally, is even found in children who have lived more than four or even six weeks.

The infarction manifested itself in sharply defined, golden-yellow streaks in the pyramids. These streaks run together concentrically in the papillæ, and for that reason are also found thicker there. Under the microscope they are recognized as small cylindrical columns, which on being strongly compressed, crumble down, and a reddish powder appears, consisting of amorphous lithates, epithelium from the straight urinary tubules, and small rhomboid crystals of uric acid. Sometimes these are precipitated as a carmine-red powder in the pelvis of the kidney, and in the most dependent part of the bladder. The red powder now and then found in the diapers of new-born children is seen to be the result of uric acid infarction. (Vogel.)

Symptoms.—The appearance of the red sand is the significant symptom that is diagnostic, and obstruction, retention and death should be anticipated.

The *treatment* that occurs to us as Homœopathic would be *Aconite* where feverish restlessness, is present. *Lycopodium* if there is much red sand and attending colic.

HYPERÆMIA, HÆMORRHAGE AND ANEMIA OF THE KIDNEY.

Hyperæmia is more frequent than anemia, and it may effect the whole gland or be partial, and be either arterial or venous. When it is arterial the nodules are injected, while in venous hyperæmia the cortical substance is chiefly affected. Renal hyperæmia occurs in almost all diseases which produce obstruction to the circulation such as heart and lung diseases, hooping cough, the acute exanthemata, cholera, tetanus, convulsions, etc.

Hæmorrhage from the kidneys which is not unfrequent in children, appears under the form of ecchymosis, and not as apoplexy of the kidneys, the parenchyma being at the same time healthy. Hæmorrhage from the kidneys and hæmaturia are most marked in purpura, and variola hæmorrhagica, scarlatina, croup, pneumonia, scrofulosis, tuberculosis, chronic exanthemata, and such diseases as eczema and pemphigus. A sudden increase in the pressure of the blood caused by forced and fatiguing exercise may also produce them.

Anemia of the kidneys is either the expression of general anemia from obstruction to the circulation, or the result of some parenchymatous disease of the organs.

The *treatment* will be directed to the disease giving rise to the hyperæmia, hæmorrhage, or anemia.

INFLAMMATION OF THE PARENCHYMA OF THE KIDNEYS. NEPHRITIS ALBUMINOSA. BRIGHT'S DISEASE.

Bright's disease is of more frequent occurrence in children than is generally supposed, is oftener acute than chronic, (acute more frequent in girls, chronic in boys), but in, by far the greater number of cases it is a secondary, very exceptionally a primary disease, and differs in intensity and extent, according to its etiology. (Steiner.) The acute form being much more frequent than the chronic, and as the latter differs in no respect from the disease as it occurs in adult the former only, will receive consideration here.

Pathological Anatomy.—The kidneys are perceptibly enlarged, generally in consequence of an increase in bulk of the cortical substance which is of dark-red color, brittle and friable. The pyramids are much less altered, and reveal nothing more than a greater vascular turgescence, producing a general dark red color, or gradually pass into the yellow of the cortical substance. The enlargement of the kidney is due to an exudation of fibrin which fills up the tubuli contorti, and may be microscopically demonstrated in the fluid scraped from the cut surfaces. Numerous Bright's casts can be seen under the microscope which are sometimes clear hyaline, sometimes again still surrounded by epithelium cells and perceptibly contain blood-corpuscles. These casts though in much less quantity are also met with in the tubuli recti, and are never totally absent from the precipitate of albuminous urine. When these children succumb at the very commencement of the disease, the urine will be found to contain so many blood corpuscles as to color it dark red. After some time it is clear, yellow or turbid; the blood-corpuscles and coloring matter of the blood have disappeared, but albumen and casts may still be detected. In the next stage, that of fatty degeneration and atrophy, the surface is uneven and nodulated. This slight uneveness arises from the metamorphosis of the fat, and the succeeding atrophy, which does not progress uniformly on all parts of the cortical substance. While one part is already flabby, and begins to waste, the other is firm, with exudation, and occupies its former large space. Here and there yellow spots are to be seen on the gray surface; the contents of the epithelium, and later, also the cellular membrane, change into fat granules and degenerate into an amorphous pultaceous mass. Dropsical effusions into the peritoneal sac, pleura, peritoneum and pericardium are also found in almost all cadavers, often combined with inflammatory exudation, especially upon the pleura. (Vogel.)

Symptomatology.—It is after scarlet fever that three-fourths of the cases of acute Bright's disease are met with. The first signs of disease of the kidney usually appear when the desquamation is at its acme. The child who to all appearances is already perfectly well, and has a good appetite, suddenly loses it. A feeling of chilliness, amounting in older children to a rigor, striking pallor of the face, nausea, frequent vomiting, disturbed sleep, lassitude, slight symptoms of fever, (pulse 112-120) bleeding at the nose, and pain in the region of the kidneys. The face assumes a puffed appearance; the integument of the lower eyelids becomes elevated into glistening sacs;

later the entire surface of the body is affected with anasarca. Simultaneously with these phenomena, a palpable diminution of the secretion of urine is observed. This may be either of a cloudy, red or brown, sometimes even dark like coffee grounds. When heated it deposits varying quantities of albumen, and under the microscope presents blood, hyaline and epithelial casts, and thicked epithelial cells. The specific gravity may be either normal or remarkably high, and the reaction is generally acid. (Steiner.) The chemical and microscopical changes of the urine are the same as in Bright's disease in the adult.

The date of the appearance of the dropsy is liable to very considerable variation, occurring sometimes within the first week, at other times as late as the end of the third week or even later. In the great majority of instances, however, its symptoms after the end of the first but before the completion of the second week; while it but seldom happens if its appearance is delayed till far into the third week that its symptoms are formidable, or that its course is acute. It sets in with considerable febrile disturbance, but even then has a great tendency to assume a chronic character; while in by far the majority of cases its attack is gradual, and its advance slow. In these circumstances, the child who has passed through scarlet fever, perhaps with less than the average amount of suffering, and who for a day or two had seemed rapidly advancing to convalescence, begins to droop, grows languid, feverish and restless. The skin becomes dry and hot; the process of desquamation is arrested while still incomplete; the appetite is lost, though the thirst is often considerable; the bowels become constipated and the urine diminished in quantity, although the desire for voiding it is very frequent. The puffiness appearing about the eyelids and in the face is apt to be overlooked until œdema has extended to the hands and feet. The degree of anasarca varies much in different cases, and likewise fluctuate at different periods in the same patient. In most cases which terminate fatally there is considerable serous effusion into the different cavities. The danger of the affection, however, depends almost entirely on its complications, for they do not destroy the patient, amendment becomes apparent by the urine gradually increasing in quantity and becoming less albuminous, the anasarca diminishes, and the case finally terminates in recovery. In patients when the attack has been severe, traces of albnmen often remain in the urine long after all signs of ailment, with the exception of those of simple debility, have disappeared.

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or *Phos acid.* If following scarlatina, *Hepar*, *Secale*, *Apis*, *Kali c.*, *Lycopodium*, etc., may be indicated. Food that taxes the kidneys like the liquid starchy foods should be avoided, and concentrated food like milk, egg, beef tea, etc., should be prefered. The bowels should be kept open with food like beef tea. The skin should be encouraged to relieve the kidneys, the child being kept in a warm room avoiding all draughts of air.

RENAL CALCULI, TUBERCLES, CYSTS AND CANCER.

Calculi.—Although most diseases of the urinary organs are less common in children than in grown persons, yet *calculous disorders* are far more frequent in early life than in adult age. The statistics of Bristol, Leeds and Norwich hospitals show that 40 per cent. of all cases of stone in the bladder are under ten years of age. Very slight and very temporary causes often suffice to occasion deposits in the urine of children; and these deposits either of the amorphous lithate of ammonia, or of the small reddish-brown crystals of lithic acid. These deposits, indeed are not of much moment, and one might perhaps say that the younger the infant, the less is their importance, since the presence of lithic acid in considerable quantity in the kidneys of new born children seem to be almost physiological. The frequency of this condition is probably connected with the great muscular strain and the peculiar changes in the processes of assimilation which take place after birth; and any interruption to their performance, or any disturbance of the cutaneous function, increases as in the case of infantile icterus, the probability of its occurrence. The same causes exert a similar influence both in infancy, and also to a considerable degree even in subsequent childhood. A trifling cold, slight gastric disorder or the feverishness and general irritation which sometimes attend upon dentition, not unfrequently produce these deposits, while they disappear as soon as the brief constitutional disturbance subsides. While it lasts, however, the condition of the child is often one of very considerable suffering, each attempt to make water being attended by much pain. the patient crying and drawing up its legs towards its abdomen; while frequently a few drops of urine only are voided at each time. Now and then the suppression of urine is complete for twelve, eighteen or twenty-four hours, but th
happens, except in children previously much out of heal

The concretions found in the kidneys vary from the size of a pin's head to that of a pea, or cherry stone. Their presence may produce no very distinct symptoms, but their existence may be suspected from the presence of grit in the urine, accompanied by straining and pain on passing water, or even reflex spasm of the urethra. Suppurative pyelitis with ulceration of the pelvis of the kidney, is sometimes produced by the retention of calculi there.

Therapeutics.—The remedies that have afforded relief are *Lycopodium*, *Belladonna*, *Calcarea*, *Sarsaparilla*, *Sepia*, *Apomorphine*, *Arsenicum* and the local applications of hot compresses or placing the child up to the waist in a warm bath.

Renal tubercle occurs in two forms. In one case the kidney is simultaneously attacked with the rest of the parenchymatous organs by miliary tuberculosis, which scarcely produces any renal symptoms at all and is only discovered in the cadaver. In the other the tuberculosis in boys is more of a local nature, and extends upward from a tuberculous testicle, first to the mucous membrane of the bladder then to that of the ureters, and finally also to that of the kidneys. In this case a considerable portion of the kidney may be encroached upon by a large, yellow, cheesy tubercle, and become excessively hypertrophied, the upper surface thereby assuming an uneven nodular appearance. Within tubercular cavities are formed as phthisis of the kidney progresses. For *treatment* consult Tuberculosis.

Renal cysts are common, pathologically and congenitally. These vary from the size of a hemp seed up to that of a cherry are usually superficial in the cortical substance, and generally filled with a clear, pellucid, thin serum. They are considered to have been caused by an occlusion of some urinary tubules.

Treatment.—These being either congenital or the result of Bright's disease, are beyond the reach of remedies.

Cancer of the kidney is an exceedingly rare disease in children, and when it does occur, medullary cancer is the ordinary form, fungus hæmatodes being very rare. The presence of a hard, nodular and immovable tumor in the region of the kidney, with the simultaneous presence of blood and albumen in the urine, and a cachectic appearance of the patient are the only reliable diagnostic signs.

Treatment.—The chief remedy for cancer anywhere is *Arsenicum*.

DISEASES OF THE BLADDER.

The bladder is a hollow muscular organ, and serves as a tempory recepticle for the urine. In structure it is similar to the ureters, with which it is continuous. Its muscular coats, however, attain a much greater degree of strength than those of the ureters, and are no longer arranged with the same regularity, consisting for the most part of obliquely running muscular bundles interlacing in a reteform manner. At the neck of the organ these fibres are disposed in a thick circular fasciculus, the *sphincter vesicæ*, besides which they form externally and on the anterior wall and summit, longitudinal masses, to which the term *detrusor urinæ* is applied. Within the organ the mucous membrane presents a smooth surface, with flattened epithelium. (Frey.)

Malformations.—Total absence of the bladder is an extremely rare occurrence, and is always combined with malformations of the organs. The ureters have terminated in the navel, the rectum and vagina. The most frequent malformations, however, is that known as *fissure of the bladder, prolapsus, s. extroveris, s. dejectus, s. ectropia vesicæ, inversio vesicæ urinæ.* These terms signify a defect of the anterior wall of the bladder, and of the corresponding portion of the abdominal parietes, so that the posterior wall of the bladder lies freely exposed. Two forms, a total and a partial, are distinguished. In the first the abdominal fissure extends from the navel to the pubis and genitals. In the second a well formed navel, normal genitals and only a small opening in the anterior abdominal parietes exist. A highly red chasm of the size of a silver dollar or more is found in the new born child in the region of the bladder, which is bounded by a sharp cutaneous ring. The red gap is only filled up after birth by the posterior wall of bladder becoming invaginated in it through the action of the abdominal pressure during crying and defecation, appearing as a fleshy, soft, fluctuating tumor. This tumor is constantly moist and tenacious, and presents at each side in its lower part, two small elevations which correspond to the place where the two ureters terminate, and are most distinctly recognized when the tumor is displaced a little upward. On closer examination the urine will be seen to ooze out in drops from these points, emitting its characteristic ammoniacal odor. In time the exposed portion loses the character of mucous membrane, and that portion above the ureters becomes dry, callous, and skin-like; below them the prolapsus frequently becomes excoriated in consequence of the incessant flow of the ammoniacal urine over it, and acquire a fungus appearance. Complete fissure of the bladder always extends into the genitals.

The *treatment* is an operation to close this unnatural orifice, for the details of which see works on surgery.

CYSTITIS. CATARRH VESICÆ. INFLAMMATION OF THE BLADDER.

Etiology.—This disease occurs as a result of internal injuries, rough calculi, misuse of *Cantharides* or *Turpentine*, the extension of some inflammatory process from some other organ, exposure to cold, or during the course of some zymotic disease, and occasionally as a croupo-diphtheritic disease.

Anatomical lesions.—These are analogous to those occurring in the adult.

Symptomatology.—The vesical symptoms may develop themselves very rapidly; in children who are susceptible to *Cantharides* they may come on within twelve hours. In calculi they come on very insidiously, often improve and then relapse. Pain and tenderness in the region of the bladder, rectum and urethra and voiding of a dark, turbid, and even bloody urine. There is usually some degree of fever, pain over the symphisis and in the region of the perineum; a continuous straining to pass water which comes away in small quantities, followed by a few drops colored with blood. In chronic cystitis the urine is always muddy, and either of a neutral reaction or faintly alkaline, and contains a large quantity of mucous and pus-corpuscles, which fall with other sediment to the bottom as the urine cools and settles. In croupo-diphtheritic cystitis the pain in the bladder and the ischuria are very severe, the fever is very marked, vomiting is usually troublesome, and shreds of the false membrane are often passed in the urine.

Prognosis.—This is varied according to the exciting cause, the disease being sometimes immediately favorable, sometimes protracted, and this is especially the case when it is due to the presence of a calculus.

The *treatment* of cystitis will vary with the stage of the disease. When the neck of the bladder on standing, walking, sitting, or defecating, increased by active exercise as running, riding in a wagon, etc. (2.) Pains often referred to the apex of the glans penis and along the course of the urethra, causing the child to hold the penis constantly in the hand, and thus lead to masturbation. (3.) Pain and difficulty in micturition, the pains becoming more intense toward the termination of the act, and last for a long time afterward. Occasionally the stream of urine is suddenly arrested, and does not start again until the child has lain down or assumed a different position.

An important aid is derived from the use of the sound, but an exploration with this instrument is seldom practicable or successful in children without the employment of *Chloroform*.

The *treatment* for stone is to remove the source of irritation by an operation. But before resorting to surgical means, remedies should be given a fair trial. If the calculi is of uric acid formation, the urine should be rendered alkaline by alkaline food or drink, but if the calculi is of alkaline formation, then the food and drink should be acid. *Galium ap.* has the reputation of dissolving stone. Other remedies, as *Cannabis*, *Sassafras*, *Uva ursi*, *Calcarea c.*, *Uranium nitr.*, *Lycopodium*, *China*, *Phos. acid*, *Nitric acid*, *Nitro muriatic acid*, *Oxalic acid*, etc., may be indicated as well as such spasmodic colicky remedies as *Belladonna*, *Chamomilla*, *Hyoscyamus*. Among the remedies mentioned for retention many will be found useful in this disorder. Hartmann thinks that one of our principal specifics for this difficulty is *Sarsaparilla*, 30th attenuation, which Homœopathic physicians have used with the greatest success. But the organism has to be thoroughly impregnated with this remedy if it is to remove the disorganization. After a period it may be expedient to exhibit some intercurrent remedy, the selection of which may perhaps be facilitated by a chemical analysis of the gravel, when it may be found that *Phosphorus*, *Silicea*, *Calcarea carbon.*, *Acidum phosphor.*, *Alumina*, may be suggested by the uric acid, the phosphate and carbonate of lime, the albumen and other ingredients of the concretion. The symptoms point likewise to *Cannabis*, *Lycopodium*, *Zincum*. *Uva ursi* may be used empirically; we know that it has cured this affection, and is partially indicated by the bloody and purulent urine, which is a pathogenetic symptom of this drug.

In lithiasis, Allopathic physicians use the carbonates as solvents, and they sometimes afford great relief; why should not Homœopathic physicians do the same? Perhaps a small dose might be sufficient, and convince our opponents of the efficacy of small doses in general.

The secondary symptoms sometimes become so violent that it may be necessary to resort to some palliative for the purpose of moderating them.

One of the principal palliatives for the spasmodic symptoms *is a solution of Camphor*, one grain in a hundred drops of alcohol, of which I give a drop every five minutes in a little warm milk or water until the pains abate, when the medicine may be given less frequently, and gradually discontinued altogether. Experience has convinced me that the second and third attenuation will do as much good as the tincture, and that the urine is even discharged with more ease.

If *Camphor* should not relieve in half an hour, we may resort to *Cicuta virosa*, one or two globules of the 30th attenuation, especially for the violent trembling of the extremities, which are rigid as after convulsions. Hartmann found this remedy to help in almost every case, and he only repeated it when another paroxysm sets in.

The seat of the disease is likewise agreeably affected by this drug. In this affection *Belladonna*, *Ipecac*, *Ignatia*. *Hyos.*, *Stramon.*, *Opium*, are likewise excellent remedies.

If the bowels should be sympathetically affected, which is particularly the case in the last stage of the spasmodic symptoms, *Veratrum*, *Colocynthis*, *Chamomilla*, *Ipecac*, *Arsenicum*, etc., may have to be exhibited. In a case of great emergency, like the present, the physician must be previously acquainted witn the pathogenesis of these drugs in order to use them with advantage.

RETENTION OF URINE. ISCHURIA SPASTICA.

Nervous children who suffer much from flatulence and colic will sometimes pass no water for more than twelve hours, on account of which their attendants are thrown into the greatest anxiety. The patients become very restless, cry fearfully, draw up their lower extremities against the abdomen and take the breast but little; this latter enables them to pass a long time without urinating. It is not, however, a serious accident or disease unless the retention is prolonged beyond six, twelve, or twenty-four hours, then it occasions concern and alarm.

Treatment.— This affection is easily cured whether it proceed from spasms or inflammation. The two chief remedies are *Aconite* and

Hyoscyamus. Hartmann's management is: At the commencement of the disorder a bath or injection per rectum of tepid milk is sometimes sufficient to remove the difficulty. If milk should not be handy, water may be substituted, taking care to mix a little bran in the water that is to be used for the bath. While the child is in the bath, the region of the bladder is to be rubbed with the hand in a circular manner. If no urine should be voided after the lapse of fifteen minutes, an injection may then be administered, which will generally procure relief. This simple treatment is sometimes insufficient and medicinal agents have to be resorted to. A little warm linseed oil may be rubbed on the region of the bladder, after which the parts may be covered with warm flannel. Or a flaxseed poultice may be applied to the region of the bladder. If the child should be very restless, if its motions should denote anxiety, if the body should be very warm, and the dry lips and the thirst should denote internal heat; if the face should be bloated and red, a small dose of *Aconite* should at once be given in order to prevent the development of an impending inflammation which might be attended with dangerous spasmodic symptoms. In two hours all the danger is generally over, and no other remedy is required. If convulsions, spasms, coldness of the extremities should already have set in, it is undoubtedly proper to give the *Aconite*, but it should be followed in half an hour by a minute dose of *Ipecacuanha*, unless marked improvement should set in shortly after the exhibition of the *Aconite*, in which case it may be allowed to act longer than half an hour, until its action seems to be exhausted. We may then either repeat the *Aconite*, or, if spasmodic symptoms should develop themselves, exhibit a dose of *Ipecacuanha.* [*Hyoscyamus* has been preferable in our experience at the Chicago Foundlings' Home].

It is my custom to avail myself of domestic remedies whenever I can do so safely and profitably. In this affection I have frequently used an infusion of the common parsley (*Apium petroselinum*) which is used as a domestic remedy for this trouble in some parts of Germany. My indication was a frequent pressing on the part of the child while it cried, as if it would press out something, after which a few drops of urine were discharged with violent cries, and such a violent twisting of the legs that the skin would almost be rubbed off the ankles; for such a condition the parsley acted as a specific. The same observation applies to the *Rosa canina* (wild briar, dog's-rose) likewise as an infusion, in teaspoonful doses; I have generally found this remedy to afford much relief.

If the retention should be of a spasmodic nature and be caused by the children taking cold in consequence of being left with a wet diaper on too long, other remedies will have to be given instead of the former. I can only furnish general indications for the selection of these remedies, and must leave the carefully individualizing physician to decide whether one or the other remedy is to be used. One of the principal remedies in this affection is *Pulsatilla* 30th attenuation. It seems to be generally suitable to the infantile organism and in this case, responds more particularly to the exciting cause and to the following conditions: Gentle character, very pale skin, a feeling of coldness which is characteristic in this disorder, low moaning or piteous crying, expression of anxiety in the features of the child, short and oppressed breathing; the heat or even the redness in the region of the bladder, denoting inflammation, does not counter-indicate this drug; on the contrary, such symptoms belong to the primary action of *Pulsatilla* on the organism, and are therefore additional indications in the present disorder. A good many drugs are capable of removing inflammatory conditions, although they are not, properly speaking antiphlogistics. If we would classify drugs in this manner, the sphere of action of many of our most valuable remedies would be unnecessarily curtailed, and their usefulness in many cases sacrificed to a foolish prejudice. But the pathogenesis of *Pulsatilla* does contain true inflammatory conditions, especially those of a catarrhal and rheumatic character, and shows a distinct correspondence to inflammatory affections of the mucous and synovial membranes, tendinous and muscular sheaths, etc.

Ischuria being a very frequent disorder among children, even of a more advanced age, I will take this opportunity of speaking on the subject more in detail. In catarrhal ischuria, *Dulcamara* 15th or 20th attenuation is an excellent remedy, though it is more suitable to larger than to small children. Larger children delight in wading through pools of water and getting their feet wet. By this means they will contract disease, especially retention of urine with discharge of a few drops of urine only. *Dulcamara* will certainly remove this difficulty, if there be a discharge of mucus from the urethra, and the urine have a milky appearance and deposit a sediment of white mucus. Though a few drops of urine keep discharging all the time, the bladder is nevertheless full, the child experiences a constant but ineffectual urging to urinate, and the moaning and groaning of the little patient, the pressing on the bladder, and the frequent drawing up of the legs denote great suffering which the little patient is unable to define.

Another excellent remedy for catarrhal ischuria is *Belladonna*, although its primary action on the healthy organism does not contain any very striking indications for the cure of morbid conditions of the bladder. It has suppression of the urinary secretions, retention of urine, with difficult emission of a few drops of urine at a time; but that which points more characteristically to *Belladonna* in this disease, are the spasms and convulsions which frequently rouse the child from a restless sleep, or set in on touching the bladder ever so little; in this case the spasms are sometimes accompanied by singultus, or a violent contortion of the extremities which finally become perfectly rigid. *Ipecacuanha*, *Ignatia*, and especially *Hyoscyamus* might likewise be serviceable in such cases; but when the above symptoms are partially induced by fright, and the child has a robust plethoric constitution, with rush of blood to the head, bloated face, hot and burning body, tormenting thirst, stertorous breathing during sleep, with frequent starting as if in affright, *Belladonna* deserves a preference over all other remedies.

Ischuria may be occasioned by pressure, contusion, by a fall, bruise or some similar mechanical injury, in which case the sexual organs become œdematous, the urethra looks red, there is pain in the region of the neck of the bladder, and the pressing and urging to urinate disappear when making pressure on the perinæum with the thumb. This group of symptoms may likewise occur without any apparent cause, but in either case *Arnica* 6th or 12th attenuation, will afford speedy relief.

Rhus, 30th attenuation, may also be found useful when the dark and almost bloody urine is discharged in drops, and there is some difficulty of moving the lower limbs; the disease was caused by a fall or blow on the sacro-lumbar region. *Pulsatilla* should likewise be thought of in such a case.

Some children contract a habit of playing with their private parts. This is sometimes owing to the presence of worms especially in older children, but I know positively that in many cases this habit is taught them by their nurses. Among the many pernicious consequences of the premature excitement which is occasioned by this abuse, retention of urine is one of more immediate occurrence. As a matter of course, the abuse should at once be put a stop to, and proper treatment be resorted to. If the above mentioned remedies should prove ineffectual; if the excessive crying of the child during the passage of a few drops of urine, the swelling of the pubic and inguinal region, the sensitiveness of the hot scrotum to the touch, the bloating of the penis should indicate the existence of acute pain; if the body should be cold, the face pale and the little sufferer should be tormented by excessive thirst, and yet be unable to swallow drink, the higher attenuations of *Cantharides* will prove specifically adapted to such a condition.

Cannabis is strongly recommended by some practitioners for such a case. I am unable to say much either for or against this agent. Difficulty of urinating, and pain with cries while passing a few drops of urine, seem to be its principal indications in ischuria. The inflammatory and consensual symptoms are but feebly developed.

In children of six months old, I have seen retention of urine induced by brandy, which had been given the child for the purpose of putting it to sleep. I have been called to prescribe for such cases, without being acquainted with the exciting cause. There were no spasmodic symptoms; the affection seemed to be of a paralytic nature, with symptoms of sopor; even when wide awake the child did not seem to possess its usual brightness. The idea that hydrocephalus might be approaching, did not satisfy me entirely, and all I felt able to do, was to select a remedy in accordance with the symptoms. I gave *Opium*, 6th attenuation, and rejoiced at the idea of having cut off such a dangerous malady in its very germ. But in a few days the same symptoms made their appearance. The child was pale, stupid, the breathing was stertorous; the child could not be roused; not even by the frequent retching and vomiting, or by the periodically recurring-pressing and drawing up of the legs. As soon as I found out the true cause of the trouble, *Nux vom.*, 30th attenuation, was given with speedy and complete relief. But not only is ischuria caused by abuse of spirits,but also in other forms of ischuria or strangury arising from cold, or a derangement of the stomach. *Nux vomica* is a specific remedy; for urinary affections are embraced in the physiological action of this drug.

The above-named are the principal remedies which should be used in this malady. In chronic cases, when the trouble recurs after the least exposure, other remedies have to be given either alone or alternation with the foregoing. Such remedies are *Sulphur*, *Sarsaparilla*, *Phosphoric acid*, *Lycopodium*, *Causticum*, *Sepia*, *Nitric acid*, *Plumbum*.

URODIALYSIS NEONATORUM. ATHREPSIA URINÆ.

In addition to the uric acid obstruction already noticed, in low or debilitated conditions, new-born infants sometimes discharge the urine in drops; it is red and seems to burn; for, while passing it, the infants cry, bend double, draw up their legs; the bowels are either bound or the passages resemble stirred eggs; the breath smells sour, with sour eructations and vomiting. Afterwards the skin in many parts becomes excoriated; they assume a brown color, and secrete a corrosive mixture having the smell of urine; the epidermis sometimes rises in the shape of eczematous vesicles or blisters of a larger size, like pemphigus, which break and leave superficial ulcers. The urinary difficulty does not always last uninterruptedly. During recovery the symptoms gradually disappear, but there remains a disposition to relapse.

This disorder is sometimes complicated with the following diseases: Athrepsia, peritonitis, the abdomen which had been spasmodically drawn in heretofore, becomes tympanitic and painful to the touch; disease of the liver, with malignant jaundice; irritation of the pneumo gastric nerves, with sudden spasm of the chest, short, panting breathing, abdominal respiration and lastly vomiting which terminates the attack; gastritis, acute hydrocephalus, etc. All these various complications may render the disease fatal. Before these complications take place, the moist sores frequently dry up.

This disease, essentially one due to mal-nutrition is to be met with only among infants. Its primary causes are previously-existing herpes of the mother or nurse; congenital syphilis; food which engenders acidity, vitiated milk, badly prepared paps made of flour, uncleanliness. According to Hahnemann's and Hartmann's observation, the disease is caused by hereditary psora. This observation is confined by the opinion of authors who assign herpetic eruptions as the cause of the disease.

I do not think that the morbid condition of the urinary organs causes the other symptoms of this disease; the urinary irritation is not a permanent phenomenon in this affection, and it therefore seems to me that it is rather a symptom, and together with the other symptoms, constitutes the constitutional derangement. However, inasmuch as it is customary to class urodialysis neonatorum among the diseases of the urinary organs, I have not wished to deviate from the received opinion, the rather as the principal secondary symptoms of this affection will be found fully treated in other parts of this work.

Treatment.—If the affection should have been induced by the diet of the mother or nurse, and is perceived by the physician in the commencement, as soon as the characteristic difficulty of urinating makes its appearance, a cure may be effected by regulating the diet of the mother; this, at least, is best even if we deem it necessary to resort to medical treatment. If acidity should develop itself in the infant, this is a sure sign that the mother's diet is not suited to her babe and has to be altered. For the urinary difficulty *Ipecacuanha*, *Pulsatilla*, *Nux vomica*, and perhaps *China* might be given in suitably small doses, and always with reference to the exciting cause. If uncleanliness should have induced the disorder, it is a matter of course that the child should be kept cleaner. In this disease, no matter from what cause it may have arisen, baths of milk, bran, and a little castile soap are of great use, and should be administered under any circumstances. If the disease be caused by syphilis, the sores on the skin will break out even a few days after the birth of the infant. High potencies of *Mercurius vivus*, *solubilus* or *corrosivus* are the proper remedies for such a case. *Calomel* might be preferable if syphilis should have been contracted by the mother during her pregnancy, or if the infant should have been infected by its nurse. But this drug should be administered in very small doses; for at no period of human life are the salivary glands so easily affected by *Calomel* as in infancy. If this affection should result from psora, the symptoms will likewise soon become apparent, but not so speedily as in the case of syphilis. In both cases it may be judicious to bring the infantile organism under the influence of the medicine, by administering it to the mother. In the case of psora, the symptoms point to *Sulphur* as the best remedy, which should be given at increasing intervals; in case the psora should be complicated with syphilis, a dose of *Mercurius* may be interpolated every now and then, which may be followed by a dose of *Hepar sulphuris*, provided the condition of the eruption should require this agent. If the more pressing symptoms should have been removed, and only a lit passing water remain, a dose of *Lycopodium* has been applied by Allopathic physicians externally, to excoriations of children; but latterly, whether induced by our example, I am unable to determine. Hufeland, Schœnlein and Canstatt recommend it likewise as an internal medicine in various affections of children. (Hartmann.) Consult also *Cina* and *Apis*.

DIABETES.

Diabetes insipides is a common symptom in children who take large quantities of liquid, especially starchy food. Infants "raised on the bottle" are especially liable to profuse urination. Sometimes there is an inflammation or irritation of the urinary organs that gives rise to this annoying symptom. In some cases of spinal irritation profuse urination is the only objective symptom that will attract attention specially if it occurs chiefly at night. Children who nurse or feed freely at night are apt to pass larger quantities of urine than those limited to food during the day. As glucose is readily absorbed, this may be found in the urine where starchy food is largely eaten. If the food is salted too much it will cause frequent and profuse urination.

The *treatment* for this form of diabetes is both dietetic and remedial. If the child partakes largely of starchy food more milk, and occasionally beef tea or soup, should be added to the food. The quantity taken at night should be limited. If the food is given very salty, the quantity of this should be lessened. The remedies given under Bulimia, Enuresis, Spinal irritation, Indigestion, etc., should be consulted. See Foods.

ENURESIS NOCTURNA. INCONTINENCE OF URINE. BED WETTING.

This may be only a symptom, or it may constitute an independent disease. In the former case it is seen in children who are idiotic or of deficient intellect, in the course of diseases of the brain and bladder, and also in other serious affections; if the latter, the incontinence only occurs during the night, usually the bladder is emptied only once, and that during the first three hours of sleep. It occurs much more frequently in boys than in girls and may last up to the twelfth year of life — exceptionally even till the appearance of puberty.

Etiology.— The cause would seem to exist in deficient sensibility of the nerves of the bladder, which is such that the irritation of the distension of the bladder is sufficient to excite the motor apparatus, but not to produce consciousness, and this occurs the more if the sleep be very deep. This anæsthesia is sometimes the expression of general debility, so that very generally, though not invariably the enuresis is found in scrofulous and rickety children; or it may be local, and the indication of some weakness of the bladder.

Indolent ulcers may form on the nates and lower extremities as the result of urinous excoriations.

Treatment.— As is the case with many other diseases of children, so likewise this weakness; it seems to spring from a psoric, herpetic, or scrofulous diathesis. Most children affected with this infirmity, have a weakly constitution; they look pale, sickly, with blue margins around the eyes, and other symptoms like those denoting the presence of worms, which frequently give rise to this disorder. Since a scanty, unwholesome diet favors the development of such a weakness, this explains its more frequent occurrence among the children of the poorer classes when of a more advanced age, whereas among the wealthier classes children of from three to six years are more frequently affected by it. The following dietetic rules are indispensable to a cure: Not much drink in the evening, no beer, tea, a moderate supper; children should sleep on horse-hair mattrasses, instead of feather beds; the body should be washed with cold water every morning, and then properly dried and rubbed off. The use of cold water will diminish the excessive irritability of the sphincter vesicæ, and will enable the patient to retain the urine for the purpose of accustoming the sphincter to a more vigorous resistance, and the bladder to increased dilatation. The child should likewise be taken up in the evening after a few hours sleep, and if it lie on the back, it should be turned over on the side. As regards the treatment, *Sulphur* 30th attenuation, will be found to answer in most cases, giving at first a dose every other day; after the lapse of eight days, one every four days, gradually lengthening the intervals. If *Sulphur* should not cure the trouble, we shall have to examine the case very carefully in order to find some characteristic symptom for the selection of another medicinal agent. This will sometimes be found out of the way symptom which had escaped our attention. *Pulsatilla* is suitable to children having slender frames, with blonde hair and a mild disposition; it seems to be more suitable to girls than boys *Sepia* 30 may likewise be considered under such circumstances, and, together with *Pulsatilla*, is moreover indicated by an excessive secretion of mucus from the pudendum. *Graphites* 30 may be useful when *Sulphur* has proved ineffectual, especially when some cutaneous eruption for which *Graphites* is indicated, is present. The same remarks apply to *Carbo veg.*, *Dulcamara*, and *Mercurius*. Other remedies are *Causticum*, *Natrum muriaticum*, *Belladonna*, *Cina*, *Conium*, *Hepar sulphuris*, etc., to the pathogeneses of which the physician is here referred. (Hartmann.)

Argentum met.—Too profuse flow of pale urine, especially during the night.

Belladonna.—Starting, restless sleep; moaning and screaming during sleep; glandular enlargements; involuntary micturition at night.

Calcarea carb.—Fat, flabby children. with red face, who sweat easily and catch cold easily; frequent urination at night.

Causticum.—Children with black hair and eyes, who pass urine during their first sleep.

Cina.—Frequent urging, with copious urination, all day, restless sleep all night.

Equisetum hyem.—Enuresis by day or night; it acts well, when it remains a mere habit, after the primary cause has been removed.

Kreosote.—Frequent urging to urinate, with copious pale discharge; wets the bed at night, wakes with urging from deep sleep, but can not retain the urine; worse when lying down; better when walking or standing. Teeth decay early.

Mercurius.—In children who perspire profusely, and whose urine is high-colored, hot, acrid, sour-smelling, with sudden irresistible desire to urinate.

Petroleum.—Weakness of neck of bladder, urine drops out after urination; involuntary micturition at night in bed; chronic blennorrhœa.

Plantago.—Unusually free and profuse discharge of urine; nocturnal copious enuresis, particularly when depending upon laxity of the sphincter vesicæ.

Selenium.—Involuntary urination when walking; dripping after stool or micturition.

Sepia.—Child wets the bed almost as soon as it goes to sleep, always during first sleep; urging to urinate from pressure on the bladder; frequent micturition at night.

Silicea.—Involuntary micturition at night, especially in children suffering from worms or chorea; weakness in urinary organs, constant desire to urinate.

Sulphur.—For pale, lean children, with large abdomen, who love sugar and highly-seasoned food, and abhor to be washed; micturition copious after midnight.

Thuja.—Involuntary urination at night, and when coughing; urination frequent and copious.

Consult also remedies for disorders of the digestive apparatus and nervous system. See Diseases of the Brain and Nervous System, by J. M. Kershaw, M. D.

DISEASES OF THE NERVOUS SYSTEM.

DISEASES OF THE BRAIN.

DEVELOPMENT AND MALFORMATIONS.

The Infant Brain.—We have already seen the development of the brain in the fœtus, page 33, we will now consider that of the infant.

The brain of a new-born child only resembles that of an adult in its general form; it differs entirely in its consistence and aspect. Its consistence is like that of paste, and will allow of being cut tolerably smooth; but it soon softens when in contact with air; its color is white, and there exists as yet no well-marked line of demarcation between the cineritious and medullary substance, so that in cutting the hemisphere horizontally, the centrum ovale does not appear as in adults. Yet the seat of the cortical substance may be discovered by the presence of a line less colored than the central substance, and which winds over the superficies of the brain throughout its circumvolutions. The white substance of the brain is generally very much injected, or has a large number of vessels passing through it. In every part where we have found the gray substance accumulated in considerable masses in the adult, as in the cerebral peduncles, corpora striata, thalami, etc., it is observed only that the vessels are larger and more numerous than in those which are composed of medullary substance, after the period of birth. The parts which correspond to the corpora striata in the brain of a fœtus are composed of a white homogeneous substance, with a reddish tint, and penetrated by a number of large vessels. The cerebellum also does not present between these two substances as marked a difference as at a more advanced age; but yet they are more easily distinguished, and appear much sooner than in the brain.

In a child just born, the medulla spinalis is white, its cineritious centre is not altogether of the same color as in the adult, but is of a more rosy hue, and softer. It is easy to unroll the two lateral cords of which it is formed. Its consistence is sufficiently firm to allow of its being drawn out of the spinal cord, and of its being cut smoothly.

As the child advances in age, the various constituent parts of the brain assume an aspect, form, and anatomical organization which they are to have during the remainder of life. From the ninth month to one year, the gray substance acquires a degree of vital energy, which doubtless results from the modification occurring in its texture; it first appears of a rose-color, then red, brown, and lastly of a reddish gray. It is to be observed that the parts of the cerebral mass which are the nearest to the medulla oblongata are also more advanced in their organization than those more remote — a natural consequence of the mode of organization of the cerebro-spinal apparatus, the development of which passes progressively from the medulla spinalis towards the encephalon, which hardens from below upwards.

It appears, therefore, that, from birth to the age of one year, the brain of a child is in a true state of transition, and that this organ, scarcely perceptible in the beginning, reaches its proper organization about the ninth or twelfth month, and its full development about the seventh year. Is it not owing to this modification occurring in the brain of a child that the frequency of cerebral affections at this age is to be ascribed? It happens also that at this period the teeth first make their appearance, and it has long been believed that convulsions and other cerebral diseases are to be attributed to this cause. This opinion, found in the writings of Hippocrates, doubtless derives its principal support from the respect and authority which the name of the father of medicine usually inspires. But whatever Hippocrates may have said on this subject, it is evident that the true cause of the frequency of cerebral affections in infants at the period of dentition, is in the brain. Dentition can be only one of the accidental causes of cerebral diseases; the predisposing cause exists in the organic modifications supervening in the encephalon, and it is to this part that we direct our attention. Not only has the brain undergone, during the first year, the organic modifications just pointed out, but the exercise of its functions has also increased; it has gradually acquired its control over the other organs, and it has become fit to receive from them the sympathetic indications with which it was before

hence is very much influenced by the digestive disorders.

the centre and regulator of the sensations, and this influence is felt even in disease; we frequently see, during the first periods of life, great alterations in the organs, unaccompanied by much febrile reaction, any general symptom, or any morbid sympathy; but at the age of which we are now speaking, everything assumes a new aspect: fever, which is scarcely ever seen in new-born children, here makes its appearance on the slightest cause; hence the restlessness, cries, spasms, nervous mobility, so common, so easily excited, and at the same time so transient in children who have passed the period of infancy. These considerations will prove to us the difficulty of studying the diseases of early infancy; the cause is evidently in the organic imperfections of the encephalon, which cannot reveal to us the signs and external symptoms of these diseases.

Whilst the medulla spinalis is undergoing its organization, the vertebral column has also passed through its periods of formation in nearly the same manner. The membranes of the spinal marrow and brain are formed very early, as we have seen on page 35, and present their peculiar disposition and form, so that at birth they possess all their vital and organic properties; their diseases, therefore, are similar to those of the meninges in adults, giving rise to nearly the same symptoms.

The arrangement of the vascular system of the brain and spinal marrow deserves the attention of physicians, for the disturbances which supervene in the cerebro spinal circulation may arise from the disposition of these vessels. There are the large meningo-spinal veins which pass up through the lateral parts of the spine, and also a network of veins between the dura mater, and the posterior surface of the vertebræ. There is also behind the dura mater, a thick layer of cellular tissue, which, in young infants, is infiltrated with a yellow serum, the consistence of which is sometimes gelatinous, and must not be considered as a morbid production. The network of spinal veins is almost always engorged with blood, arising, without doubt, from the slowness with which the venous circulation of the spine is affected at this period of life; the arteries present nothing peculiar.

Between the piamater and the arachnoid, which is reflected on itself a space of greater or less size, which is interrupted at intervals by small thin ligaments, and where there is constantly during life a serous fluid communicating with the fluids of the cerebral ventricles; the pia mater, which is essentially vascular, while the arachnoid is without vessels, is less adherent to the surface of the brain in children than in adults; the pia mater of the medulla is more cellular and solid than that of the brain, and becomes thicker at its inferior part; in order, therefore, to satisfy ourselves of the state of softness or firmness of the medulla spinalis, we must always remove from it the pia mater, which can easily be done.

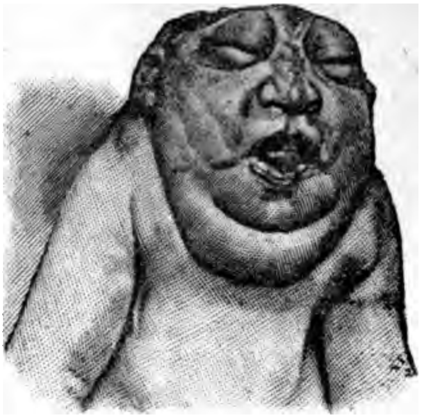
The brain and spinal marrow are, during life, in a state of continual movement, elevation, and depression; the motion of the spinal marrow was a long time unknown; the demonstration of it is due to M. Ollivier, and who has very satisfactorily explained its mechanism. There are, says he, three very evident causes which produce the motion observed throughout the whole length of the spine; first, the shock of the part from the action of respiration on this organ, next the dilatation of the vessels when there is an afflux of blood, and lastly, the motion of the spinal fluid by each respiration.

Acephalia, which consists in the absence of the brain and even of the medulla oblongata, is seen only when the head, face, and upper part of the neck are wanting at the same time; in such a case life cannot be established, and the fœtus, which only existed by its communication with the circulatory apparatus of its mother, dies as soon as this communication is broken off.

Anencephalia consists in the absence of one part of the brain, with or without the absence of the cranial cavity.

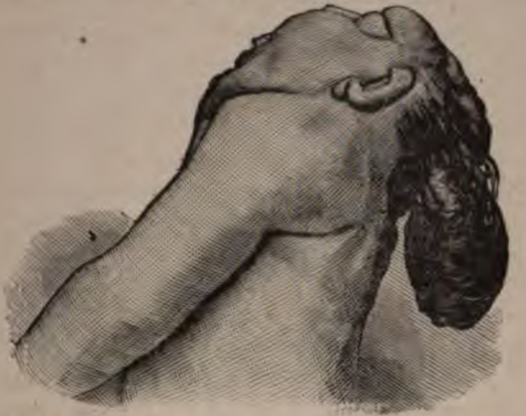
That these abnormalities are cases of arrest of development, can admit of no question and that they afford a wide field of physiological investigation which has been but partly explored, is equally true. Churchill relates of one in his possession where the brain presented the appearance of a bunch of tumors; another where it was entirely wanting, and a third where a portion only of the brain existed. In each the cranial vault was absent, the base of the skull alone remaining. When the cranium is wanting the term *Acrania* is used to designate them. Examples of such an arrest of development in the brain or cranial vault may be seen in every museum and numerous plates of such cases are to be found in Geoffrey St. Hilaire's work on monsters.

Anencephalia presents different degrees. It exists from a species of atrophy of the cerebral hemispheres, which is seen in idiots, to the complete absence of the cerebral mass. The most usual degree of anencephalia is that where the cranium and the brain are both wanting, the upper part of the cranium being open; the ossea frontis are wanting, or are much mutilated, and there is scarcely a trace of the ossa parietalia. A shapeless cerebral mass, covered by red and bloody membranes, is situated at the base of the cranium, which is usually found nearer the shoulders than in a natural state; the projection of the orbitar arches and of the eyes, the face which presents some analogy to that of the head of certain of the lower animals, to which the vulgar will sometimes compare these children; such are the ordinary traits of an acephalous infant, in whom is often found nothing more than the medulla oblongata, and sometimes the cerebellum, and the remains of the optic thalami and corpora striata. The accompanying illustrations represent an instance of acrania with cerebral hernia, occurring in the practice of Dr. M. M. Walker, of Germantown, Philadelphia.



A somewhat similar specimen is represented in Clay's Handbook of Obstetric Surgery.

The bones of the cranium present in infants at birth, either malformations or solutions of continuity. The former are the result of an arrest of development. Billard mentions three cases of remarkable ossification of the cranium; the osseous fibres instead of passing from the centre to the circumference of the bone, were interrupted and disposed in small isolated masses between which was found a cartilaginous substance. When these bones were felt through the integuments they appeared as if fractured or ground. The bones of the cranium sometimes leave between them large spaces, either because they are not sufficiently developed by reason of the great size of the brain, as is observed in hydrocephalus, or because the development has been arrested. The fontanelles are in consequence of this very much spread allowing a greater or less quantity of the brain to project, forming a real hernia.



Hernia of the Brain.—Simple encephalocele or cerebral hernia, by which names it is also known, occurs whenever a part of the cerebrum or cerebellum protrudes through a cleft of the bones of the skull; when together with this protrusion there exists a greater or less collection of serum it is termed a *hydroencephalocele*. The nature of the hernia is easily ascertained, particularly from its situation, for it occupies a point corresponding with one of the fontanelles. It is most usually met with projecting from the occiput and in the nasal part of the frontal bone, though it may also be met with in the smaller sutures. It varies in size from that of a pea to that of a child's head according to the position of the prolapse and the quantity of serum present, and may be either pointed or flattened. The tumor is covered with healthy skin, though it is often thinned and devoid of hair, usually pulsates, is sensibly influenced by strong respiration especially by cries and coughs, and may be more or less reduced by pressure, though this must be attempted with the greatest care, as manipulation may readily induce serious symptoms as vomiting, convulsions, unconsciousness, tetanic contractions or paralysis. Billard recommends that the tumor should be loosely covered, that the friction of the clothes may not produce excoriation or inflammation. The prognosis is unfavorable.

Microcephalism.—This results from two processes, either there being an arrest of nutrition and growth of the brain and skull, both remaining small, without synostosis of the latter, or there may be alterations in the bones producing premature synostosis, resulting in diminution of the brain as an effect. Vogt indicates microcephalism as the condition where the child is born with an absolutely small head, and where the synostosis has nothing to do with the arrest, the explanation being solely an arrest of the development dating from about the tenth week of life, and affecting chiefly the part of the brain which has to do with the mental powers. From his observations the brain of the microcephal exhibits the great typical convolutions, but in many the convolutions are so indistinct that the anterior lobes seem entirely destitute of them, or to exhibit them only as in distinct furrows. It would seem that Vogt's view is too limited and undoubtedly includes cases where the microcephalism has arisen in synostosis of the skull. (Virchow.)

Unilateral Atrophy of the Brain sometimes exist.

Malformations of the Spinal Cord—Amyelia.—The complete absence of the medulla is called amyelia, and it would appear that its absence is always coincident with that of the brain, according to the statements of Morgagni and Ollivier. The medulla spinalis may exhibit a deformity at its upper extremity; in the case of anèncephalia, the pons varolii exists, or may present nothi g more than the rudiments; sometimes the spinal cord exhibits a trace, more or less deep of its division into two lateral portions, or it is suddenly obliterated near the fourth ventricle. Children affected with this deformity do not die immediately after birth, for the heart and lungs, which receive their nervous influence from the upper portion of the medulla, may perform their functions for some time in a manner that will preserve life for many days. Indeed such children have been seen to respire, cry, suck and swallow.

The division of the medulla spinalis into two lateral cords, to a greater or less extent, which Zacchias, Manget, Ollivier and Hall have pointed out, may exist with complete spina-bifida, although the skin may be perfect at the place of the separation of the vertebra; this malformation will not allow of the establishment of independent life, and children thus affected die immediately after birth, or give no sign of life; another malformation consists in the doubling of the medullary portion, and is particularly met with in fœtuses that are double. Lastly, in the centre of the medulla spinalis may be a canal, the effect of a mechanical distension which this organ may experience from the serosity accumulating in the centre of the cerebral cavities, in cases of hydrocephalus or hydrorachis.

Kyrronosis.—Among the congenital diseases of the medulla spinalis may be mentioned an icterous affection of this part, and which M. Lobstein has described under the name of kyrronosis, and of which he has seen two instances in embryos of five months. This author is of opinion that it is a disease peculiar to the first period of intra-uterine life.

Spina Bifida Hydrorachis. Hydromenincocele. Hydromycele.—By hydrorachitis is understood a congenital tumor of the vertebral column, generally situated in the lumbar or sacral region, and produced by a protrusion of the meninges of the cord through a bony aperture in the spinal canal. The defect may be confined to a portion or include the whole canal. This last is only met with in monsters, hemicephalia, etc. In the mildest form of the disease the laminæ are imperfectly developed, or, being normal, the spinous processes are not united and exhibit a narrow fissure between them, or the spinous processes may be entirely absent, or, the bodies of the vertebræ are separated, and a wide fissure is seen to extend through the entire thickness of the spinal column. Again, the fissures are still wider and several of the vertebræ are in a rudimentary state. Through these chasms sacs are prolapsed, distended with serum and varying greatly in size. They are formed from the dura mater and arachnoid and always fluctuates more or less distinctly. If the spinal marrow also passes through the gap, a hydromeningocele is formed, an occurrence which is analogous to the cerebral hernia. If the termination of the spinal cord is inserted into the wall of the sac, a peculiar umbilicoid retraction is perceptible, to which attention was drawn by Virchow. Occasionally the sac is divided into two cavities by the cord stretched into the form of a thin membrane. (Bednar.) In shape the tumor is oval or pear-shaped, and continued into the vertebral canal by a narrow neck; sometimes it has a broad base; the integumentary covering is discolored and red. Pressure upon the tumor is painful and often produces tetanic spasms. The subjects are mostly born alive, but rarely live longer than a few days. The tumor often bursts during delivery, and sometimes becomes gangrenous without rupturing. Occasionally the patient survives and reaches adult life. As a rule, opening the sac leads to meningitis with all its train of bad consequences. (See Rickets.)

Treatment.—Puncture, injection of *Iodine*, acupuncture, excision, erasement, etc., usually hasten the fatal termination, and cure by them is exceedingly rare. Systematic compression by means of *Collodion* has been recommended. A well-fitting concave plate of tin, strong leather or gutta percha should be used to protect the tumor from injury. Cases are on record where a steady and systematic pressure from the elastic ligature has gradually reduced the hernia. The value of *Calc. phos.* should not be forgotten.

CONGESTION OF THE BRAIN—HYPERÆMIA CEREBRI.

There is a remarkable liability to congestion of the vessels of the brain in infancy lasting through all the years of childhood. It is very likely to come on in the course of affections of distant organs, but it is not merely as a serious complication of many other diseases that this cerebral congestion deserves notice, for its importance depends still more on its constituting the first and curable stage of many diseases of the brain, which unless arrested at the outset, will soon pass beyond the resources of medicine. Although inflammation, hæmorrhage and the effusion of serum, are the three results, to one or other of which congestion of the cerebral vessels tends, yet the exceptions to their occurrence are by no means few, even when that congestion has been very considerable or of long continuance; and not only may the functions of the brain be seriously disordered, but the life of the patient may be destroyed, without the anatomist being able to discover any one of these results, or indeed anything more than a general repletion of the vessels of the organ.

Etiology.—Any cause which greatly increases the flow of blood to the head, as acidity of the prima via, or which greatly impedes its reflux, may give rise to a congested state of the brain, and according as this state is induced by the one or the other cause, it is said to be *active* or *passive*. The active form of cerebral congestion is associated with and in a measure dependent on excitement of the heart's action, and is therefore observed in connection with various forms of febrile disturbance; while the passive form receives its best illustrations in cases of hooping cough, and of spasm of the glottis, in which violent and fruitless expiratory efforts are made. The brain may become actively congested at the time of teething, or from chronic gastritis or indigestion, or from a bow upon the head, or the state may come on independently of any definite exciting cause; or a state of passive congestion, may be induced by some mechanical impediment to the return of blood from the organ,—such as the pressure of a hypertrophied thymus, or of enlarged and tuberculated bronchial glands upon the jugular veins; or it may be merely the result of a languid circulation from the want of pure air, giving a preponderance of venous blood, or of nourishing and sufficient food, or to drugs.

It has been asserted that the symptoms of violent cerebral disturbance which sometimes usher in the eruptive fevers, and even prove fatal before the rash has had time to show itself, were among the most striking illustrations of active cerebral congestion, but this is now denied by some of the best authorities. These symptoms, it is said, do not in any sense depend on an increased flow of blood towards the brain produced by the excited action of the heart, but partly on the high temperature of the blood circulating in the cerebral vessels, partly on its altered composition due to the greatly intensified metamorphosis of tissues which the fever produces. The so-called asthenic fevers are a remarkable example of the truth of this opinion, since in them there is an extremely high temperature associated with enfeebled though accelerated action of the heart, but with no determination of blood to the brain, while yet we meet in them with most marked delirium, and with the gravest disturbance of the brain functions.

As febrile disturbance frequently attend the process of dentition, it is not difficult to understand how, when the circulation is in a state of permanent excitement, a very slight cause may suffice to overturn its equilibrium, and occasion a greater flow of blood to the brain than the organ is able to bear. Sometimes too, and that by no means rarely, symptoms of cerebral congestion come on for which it is not possible to assign a distinct exciting cause and for the explanation of which there is the well known fact that all periods of development such as childhood, are periods during which the growing organs are most apt to be disordered. (West). Cerebral congestion may also arise from relaxation of the walls of the bloodvessels (vasomotor paralysis), and of the parenchyma of the brain; from alteration of the composition of the blood (toxæmia); from insolation, and in some instances from the abuse of stimulants and narcotics.

Pathological Anatomy.—Hyperæmia of the brain, or of its membranes is almost always general, seldom circumscribed or local. It is indicated externally by a congestion of the skin and superficial coverings, and by an outlining in dark blue color of the bones of the skull. In the distended sinuses of the dura mater is found thick, dark blood, partly coagulated, and the membrane itself is bluish-red, deeply injected, and tightly stretched. The vessels of the pia mater are injected up to their minutest ramifications, and are convoluted or even varicose. When the hyperæmia is due to mechanical causes, such as enlarged glands in the neck it may be confined to the half of the brain, corresponding to the side on which the enlargement exists. The brain is markedly congested, the sulci appear narnower, the cortical substance of a deeper red, and the white substance scattered with numerous blood-points, which are confluent in some places. If the hyperæmia have been of long continuance, there may be œdema of the cerebral substance, with effusion of serum into the ventricles, rarely effusion of blood, and the choroid plexuses are found much congested and sometimes occupied by small cysts. In more advanced children in whom the affection has been chronic; there is frequently found a milky obscuration of the arachnoid and increased size of the pacchionian bodies.

Symptomatology.—It is not possible to arrange the symptoms of cerebral hyperæmia into a definite group, since they vary with the nature of the exciting cause, with the degree of hyperæmia, and the age of the child; and since they may indicate irritation of the brain or compression. Symptoms of cerebral irritation generally precede those of compression, though the contrary may be the case especially when the hyperæmia is passive, the result of obstruction to the venous return. These are shown in such states by more or less reddening of the face, transient flushing of one or both cheeks, injected conjunctivæ, epistaxis, contracted pupils, a distended and strongly pulsating fontanelle, increased temperature of the head, especially of the forehead and occiput, very often a whining, peevish and restless disposition, aversion to light, together with nausea and vomiting. There are generally headache and delirium in more advanced children, together with great irritability when any noise is made, unquiet sleep with frequent outcry, grinding of the teeth, slight muscular contractions or even general convusions, a somnolent or comatose condition, disinclination for mental occupation, feelings of oppression and pain in the head, dilated pupils, rapidly progressing paresis, difficult breathing, and small pulse.

Cerebral hyperæmia often appears suddenly and disappears with equal rapidity, or it may be persistent and lead to the results above described. This is frequently seen in hooping cough, which seems to act frequently as an exciting cause of cerebral hyperæmia, for in its course there is often marked hyperæmia of the head from obstructed venous return. (Steiner).

In the paroxysms of hooping cough the brain becomes congested by the impediment to the return of the blood from the head; and cerebral congestion is induced in a similar manner when the larynx becomes spasmodically closed in laryngismus stridulus. These are instances of the *passive form*. But cases are likewise met with where the passive succeeds to the active form of cerebral congestion, or becomes more or less gradually developed out of some disorder of the abdominal viscera; or where it supervenes towards the close of life in weakly children, whose vital powers have at length become too feeble to propel the blood. (West).

There is a sort of passive cerebral congestion in infants which manifests itself at the moment of birth as we have seen (p. 715) under the influence of a difficult parturition or of an unnatural position of the fœtus. The skin, particularly that of the head and face is quite cyanosed, of a livid-red color, interspersed with blue spots; the lips are violet and pendant; the eyes closed; the beat of the heart feeble; and respiration cannot establish itself. If this condition is prolonged death is the consequence. When it is possible to establish respiration the livid color of the skin disappears, and is replaced by a rose tint, at first manifested upon the lips and face, before it becomes general The heart beats with more force; its movements become regular and give more action to the respiratory forces, and life is saved if a relapse, caused by the cries of the child, does not renew the cerebral congestion, and again interrupt the action of the heart and lungs. When such children die, the meninges are found very much congested, and the vessels of the pia mater enormously distended. The brain appears swollen especially when there is infiltration of blood into its parenchyma. If the organ is incised, the cut surfaces are covered by a multitude of small drops of blood which soon unite together to form larger drops. There are no lacerations of the tissue nor well determined apoplectic spots. All the soft parts of the head are gorged with blood. In such cases life is extinguished by an increase of the excitation of the brain. It is compressed in its action by the violent sanguinous congestion of the organ, the efforts of which are paralyzed. (Bouchut).

Treatment.—As congestion is one of the most frequent precursors of brain troubles in children, it demands prompt treatment. The symptoms are the best guide for the selection of the remedy, although the exciting cause should also receive our attention. If due to derangement of the digestive organs, the food question should receive the first attention. If due to hooping cough or spasm of the glottis, consult remedies under that head. If due to fall or blow, *Arnica.* If due to enlarged thymus or bronchial glands, consult remedies under those heads. If due to *Opium*, or the fashionable *Bromide of Potassium*, *Chloral* or *Atropia*, the proper antidotes must be given. If the case is urgent *Camphor* may be given until *Coffee* can be prepared, which should be strong and given in teaspoonful doses every few minutes until consciousness returns, or until the similar remedy is selected. Cases of mild cerebral congestion may need *Aconite*, *Nux vom.*, *Arnica* or *Verat. vir.*, but if the coma is profound, the pupils dilated and the respiration stertorous, with stiffening of the body, *Belladonna*, especially if there are twitchings of the muscles of the *right* side. If the coma becomes more profound and the breathing *slow* and stertorous, *Opium* should be given. If there is spasms of the muscles of the *left* side, especially of the pharynx, with threatened paralysis, *Lachesis*. After these remedies have improved the case, then *Hyoscyamus*, *Nux vom.*, *Cocculus*, *Cina*, *Cuprum*, *Arnica*, *Sulphur*, etc., may be needed to complete the cure.

SOFTENING OF THE BRAIN.

This is a lesion peculiar to the encephalon of new-born children, and is the result of congestion of this organ. This is a species of softening either general or local, which, far from presenting the characters of inflammation, on the contrary presents all the signs indicating decomposition, and we might almost say putrefaction, of this organ. The following case is an instance of this affection.

Alexis Louart, aged three days, entered the infirmary. He was affected with a general induration of the cellular tissue; the integuments were of a violet-red in all parts of the body; the cry was smothered, painful, and, at times, very acute, The chest sounded obscurely. He was, besides, affected with a very abundant diarrhœa. The pulsations of the heart were quick, but of extreme smallness. There was no change in his condition on the succeeding day, and he died in twenty-four hours. On a post-mortem examination, the digestive apparatus was found injected in almost its entire extent. The liver was gorged with black and fluid blood; its tissue was hard and of a brown slate color; the lungs were flaccid, blackish, slightly dilated with air, and gorged with blood at their posterior edge. The fœtal openings still existed; the meninges were very much injected; the cerebral pulp was red, and reduced to a soft mass, which flowed freely on making an incision into the arachnoid membrane, diffusing a very evident odor of sulphuretted hydrogen. This softening extended even to the lateral ventricles, where was found a quantity of effused blood: the rest of the brain was softened, and of a violet color, but was far from being soft, like that part of the hemispheres above the ventricles.

Here it is evident that this general disorganization of the cerebral pulp was the result of its contact and mixture with the blood effused in the ventricles, and infiltrated in the proper substance of the brain; for there almost always exists cerebral hæmorrhage at the same time; but this hæmorrhage, when recent, may exist alone, without any softening of the brain: there is only observed, at the superior part of the hemisphere, or at the corpora striata, the points of the encephalon where the softening commences, and which already diffuses the odor peculiar to this disorganization. On the other hand, cerebral softening may precede the hæmorrhage, and may even produce it.

The softening sometimes exists only in one lobe, at other times in both; very often the whole of the cer ebral mass is so destroyed, that nothing more is found in opening the cranium, but a soft flocculent, black mass, mixed with a great number of clots of blood and pulpy flakes. It is a remarkable fact that the meninges are not involved in this disorganization, and that notwithstanding this destruction of the encephalon, children will still live some days, not possessing simply, as is vulgarly thought, a mere breath of life, but actually respiring, crying and sucking; this occurs when the disorganization is arrested at the medulla oblongata, which remains unaffected, and which, with the medulla spinalis, controls the phenomena of life, even preserving it for some time.

This softening has been found in new-born children that died immediately after birth. leading to the belief that it had its existence during the sojourn of the child within the womb.

When the medulla oblongata and medulla spinalis are thus softened, the child exhibits much less vital activity; the limbs are completely flaccid and immovable; the cry is altogether annihilated; the pulsations of the heart scarcely perceptible; the limbs are cold, and deglutition almost impossible. The child soon sinks under this state of feebleness, and the post-mortem examination reveals the disorganization of the entire nervous centre, and thus explains the symptoms and death of the child. This softening is more frequent on the lateral parts of the hemispheres and near the corpora striata, than at any other part of the brain, and is serious in proportion to its extent and approximation to the medulla oblongata.

The symptoms are usually characterized by a state of sinking, prostration, and sanguineous congestion of the limbs, body and face, and especially by the proper signs of pulmonary congestion, which almost always accompanies that of the brain. (Billard.)

Treatment.—The fact that this condition is the result of a prolonged stasis points out the treatment. See Congestion, Hæmorrhage, General Feebleness, Atelectasis and Sclerosis. Remedies that support the strength and hasten absorption like *Sulph.*, *Calc. phos.*, etc., may possibly help.

CEREBRAL HÆMORRHAGE.

Hæmorrhage of the brain may be considered under two heads, that of the substance and that of the membranes; the former is usually designated as cerebral, and the latter as meningeal apoplexy. Both these forms of hæmorrhage are of rare occurrence in childhood compared with other diseases of the brain, and with their frequency during adult life and old age. It is especially observed among infants, and more rarely during the first years of life. Of the two kinds, that of the meninges is the most common.

By cerebral apoplexy or hæmorrhage is understood an effusion of blood into the substance of the brain. By meningeal apoplexy or hæmorrhage is understood an effusion of blood between the dura mater and cranium, into the cavity of the arachnoid membrane, beneath the arachnoid, or in the meshes of the pia mater.

Hæmorrhage into the substance of the brain occurs in two different forms; one in which the effused blood is contained in a cavity caused by a laceration of the tissue of the organ, and designated apoplexy in a cavity; and the other in which the blood is effused in a multitude of little points of different sizes, and designated capillary apoplexy.

In meningeal hæmorrhage the blood may be effused between the dura mater and the bone. This form, however, is very rare, so rare indeed, that several writers deny its existence. It is proved, however, to have occurred, by a case reported by Rilliet and Barthez, which is the only one they have met with. In by far the most common form of the disease, the blood escapes into the cavity of the arachnoid membrane.

Etiology.—Rilliet and Barthez thus enumerates the causes of apoplexy: 1. The untimely cure of diseases of the scalp. 2. Diseases of the sinus of the dura mater. 3. Compression of the superior vena cava by the bronchial glands. 4. Vascular compression, owing to hypertrophy of the abdominal organs. 5. Cachexia or general debility originally connected with tubercularization.

Bouchut and Legendre remark that it sometimes appears after a violent cerebral congestion, occasionally by a fit of anger, or exposure to the sun. It is met with as often in summer as in winter.

In some instances the hæmorrhage occurs in the healthiest and most vigorous constitutions, and cannot be accounted for in any way. Cerebral and ventricular hæmorrhage are much more common after three years of age than before, which is just the reverse of the law in regard to meningeal effusion. Meningeal apoplexy which constitutes one-third of the causes of death according to Cruveilhier, occurs previous to, as well as subsequently to birth. It is not easy to explain why it should occur previous to birth in many cases, for in them there has been neither undue pressure in the use of instruments, nor undue delay in the expulsion of the body after the transit of the head; but in other cases it sometimes occurs that after the head is born, the uterine contractions cease for a time, and then the veins of the neck are compressed by the external orifice, and the cord by the body of the child against the walls of the pelvis; the face becomes livid, purple and almost black, and if the infant be not quickly extracted, it may die of apoplexy. The same result may occur in breech, footling or funis presentations. (Churchill.)

Anatomical Lesions.—Meningeal hæmorrhage takes place almost invariably in the large cavity of the arachnoid; very seldom external to this serous membrane, whether on the side of the pia mater, or on the side of the dura mater, except in cases of fracture of the cranium. It is observed in the arachnoid which covers the ventricles, but its usual position is on the surface of the hemispheres. The hæmorrhage always covers the two hemispheres. There are few exceptions to this rule. The effused blood presents very different characters according to the period of the disease. At the commencement the blood is fluid, but towards the fourth or fifth day it coa lates, the serum gradually disappears, and there remain clots of greater or less thickness which contract adhesions with the parietal serious layer. The clot, at first soft becomes gradually firmer and daily becomes diminished in size. The interior is formed of fibrin of a blackish color, which by degrees loses its coloring matter and becomes of a pale red. The serum which it encloses is slowly absorbed. It then gradually diminishes in size, and passes at length to the condition of a whitish fibrinous layer, which sometimes presents the characters of fibrous tissue. In some cases this clot entirely disappears and there remains between the two membranes which covered it, a space filled with a rose-colored serum. These cysts are according to M. Legendre, one of the modes of the favorable termination of the disease and are sometimes observed to acquire a very considerable development. They may enclose from eleven to thirteen ounces of fluid and constitute another variety of hydrocephalus. At the same time a considerable congestion of the pia mater and of the encephalon is also observed. The ventricles are slightly dilated, enclosing a small quantity of serum which is limpid or of a yellowish color, but always transparent. In young children the brain is not at all compressed by the effusion, the bones of the cranium being ununited separate and prevent compression of the cerebral hemispheres. (Bouchut).

The appearance of hæmorrhage into the substance of the brain is much the same as when observed in the adult. The clots are usually small in size seldom exceeding from one to two-thirds of an inch in diameter, though in rare cases they are larger. The capillary form of effusion occurs in the shape of a number of points about as large as the head of a pin, and have a dark or brownish color, which contrasts strongly with that of the cerebral tissue. These points consist of true coagula, which are sometimes surrounded by a small, yellowish areola. The capillary effusions are generally limited within a space of from a third of an inch to an inch and a half in size, but have been found scattered over a large portion of the hemispheres. Both forms of hæmorrhage are much more frequent in the cerebrum than cerebellum and occur more frequently on the left than right side. (Meigs).

Symptomatology.— The symptoms of meningeal hæmorrhage in children at the breast are very obscure and may be confounded with those of inflammation of the meninges or of the brain. After one or two vomitings the child is seized with fever and with some convulsive movements, the most usual seat being the globes of the eyes, which leave behind as a consequence a slight strabismus; the appetite is lost and there is considerable thirst; the evacuations are natural Soon a permanent contraction of the feet and hands is observed, quickly followed by tonic or clonic convulsive attacks. During these convulsions, sensibility and consciousness are abolished and the face assumes a deeper tint. In the interval of these attacks drowsiness is present, which though slight in the first days, augments in proportion as the disease makes progress; the fever continues during the whole course of the disease, and becomes stronger in proportion as the fatal term approaches. The convulsions grow more and more frequent becoming almost continuous in the last moments. (Legendre). According to Steiner, the anterior fontanelle is tense, more or less arched, and pulsates at first strongly, but the force of its pulsations gradually diminish, the pupils are strongly contracted, the cornea somewhat cloudy or even softened. The pulse is small and slow; the respirations are carried on slowly, and are superficial in character, with occasional deep efforts. The duration of these cases is from four to eighteen days. Paralysis is rarely noticed in the disease; it occurred only in one out of nine cases observed by M. Legendre, and in one out of seventeen observed by Rilliet and Barthez.

Dr. West remarks: "The absence of paralytic symptoms, however, is not the sole cause of the obscurity of these cases, but the indications of cerebral disturbance, by which they are attended vary greatly in kind as in degree. The sudden occurrence of violent convulsions, and their frequent return, alternating with spasmodic contraction of the fingers and toes in the intervals appear to be the most frequent indications of the effusion of blood upon the surface of the brain. I need not say, however, that such symptoms, taken alone, would by no means justify you in inferring that its effusion had taken place." Dr. West adverts particularly to the fact that apoplexy in the child is particularly apt to occur in those who are weakly and feeble, and gives to this form of the disease the appellation of cachectic form of cerebral hæmorrhage.

Death is often hastened by the appearance of intercurrent thoracic inflammation. If it were not for this complication the disease might be cured or oftener pass into the chronic state. If the child escapes the first attack, and the disease terminates by the formation of a cyst filled with serum, the quantity of which increases every day, the symptoms of hydrocepalus are observed.

The cranium is very large in proportion to the face; the sutures are not ossified; there is strabismus, with dilatation of the pupils; the sense of sight is generally but not always retained; the face loses its expression; if the child was old enough at the moment of the attack to have shown signs of intelligence, the latter is found to diminish rather than increase, and sometimes to be lost entirely, as the size of the head augments; and the child is apt to utter loud cries, particularly during the night. The cutaneous sensibility is in general neither lost nor diminished. The deformity of the head is not always general but may take place upon one side or the other, according to the position of the cyst.

The *treatment* does not promise much. If the extravasation can be lessened and absorbed the child may be saved. The remedies chiefly indicated are *Arnica*, *Belladonna*, *Causticum*, *Nux vomica*, *Opium*, *Hyoscyamus*, *Ipecac*, *Verat. vir.*, *Sulphur.* The remedies will follow each other in about the following order: *Arnica* or *Bell.* for the extravasation, and then *Apis*, *Hyosc.*, *Hell.*, or *Sulph.* for the absorption.

PACHYMENINGITIS.

This term denotes inflammation of the dura mater. It is seldom a primary lesion, being usually the result of some other process.

Etiology.—Among the causes of pachymeningitis and hæmatoma of the dura mater, traumatic injury takes the first rank; after it comes caries of the bones, especially of the petrous bone, inflammation and suppuration of the vessels in erysipelas, pyæmic affections, and general hypertrophy and sclerosis of the brain. It may originate spontaneously in wasted children affected by pulmonary and intestinal diseases or by rickets, being probably excited by marantic thrombi; also in the course of acute zymotic diseases. Children between the first and fourth years of life are most frequently attacked, and sex does not seem to exert much influence.

Pathology.— There are pseudo-membranes and delicate vascular effusions amongst which hæmorrhages of various extent are found. Some of the branches of the meningeal veins and the sinuses contain thrombi, partly dark red or rusty brown, the latter being the prevalent color if the inflammatory action be due to caries of the petrous bone. Large hæmorrhages between the dura and pia mater. produce hæmatoma, found usually at the convexity of the brain.

Symptoms.—Pachymeningitis has no certain set of symptoms by which its presence can be recognized with safety. Just as the inflammation is acute or chronic, so are the accompanying hæmorrhages sparse or abundant, and the course of the disease varies. At first the range of symptoms resembles that of cerebral hyperæmia. but it may assume the form of meningitis or even hydrocephalus during the further course or shortly before death. Children of more advanced age complain of pain in the head, affecting in cases of wounds, the part of the head in the neighborhood of the wound and in internal otitis confined to one side of the head. Children between one and three years of age betray their sufferings by great restlessness, frequent clutching of the head, crying and whimpering; nausea vomiting, slight convulsions, apathy, somnolence, and at last complete coma, are met with in the further course of the disease. Sudden hæmorrhages may produce immediate death; and sometimes even when death is not sudden, no other symptom than somnolence may be observed. The duration of the disease is sometimes short, from one to two weeks, though it may go on for three or four months, or even longer.

Hæmatoma of the dura mater displays itself generally by symptoms of a localized affection of the brain, and produces periodically occurring epileptiform convulsions. (Steiner.)

Treatment.—The fact of a fall or injury will call attention to *Arnica*, and if inflammatory symptoms arise *Belladonna* will be needed. In a grave case of traumatic pachymeningitis where the author was called in consultation, the inflammatory symptoms had in a measure subsided, under the use of *Arnica*, *Bell.*, *Bry.*, and *Bapt.*, leaving a coma, restlessness, dilated pupils, retracted abdomen, and scanty urine—evidences of effusion. *Apis*, *Helleborus* and *Sulphur* completed the cure in a month. See Meningitis, Hydrocephalus, etc., for indications.

In cases of caries *Silicea Sulph.* or *Calc. phos.* may be indicated. In erysipelas cases *Bell.*, *Arsen.*, or *Rhus.* Pyæmia, *Arsen.*

SIMPLE MENINGITIS.

By this term is understood inflammation of the membranes of the brain, independent of tuberculosis of those tissues, or of other organs of the economy. It has also been called arachnitis, and more rarely phrenitis. It is not a common affection, for out of a thousand cases of brain disease, it has occurred only eight or ten times. Rilliet and Barthez report but five cases, where they met with thirty-three of tubercular meningitis.

Etiology.—Meningitis simplex occurs in children at all periods of life up to the time of puberty, and may also occur during intra-uterine life. It is most frequent, however, under two years of age. The causes which favor its development are as numerous as they are varied. The primary form is met with in well-nourished children as well as in the badly nourished, as a result of insolation, cold, injury, excessive mental effort, although very frequently no cause can be assigned for the attack. Secondary meningitis occurs in erysipelas of the face and scalp, in the acute exanthemata, typhoid pneumonia, occasionally in Bright's disease, in pyæmic affections, especially in new-born children and sucklings, as a consequence of pachymeningitis, internal otitis, ozæna, periostitis, coxitis, chiefly of scrofulous origin. As causes of intra-uterine meningitis, such diseases of the mother during pregnancy, as variola and puerperal fever. (Steiner.) Epidemic influence is a cause peculiar to this variety of meningitis, and this has been fully established by Dr. Albert. (*Jour. de Hufeland.*) Repercussed cutaneous eruptions of the head and cerebral concussion also stand in a causative relation. Meningitis sometimes complicates other inflammatory diseases, such as bronchitis, pneumonia, pleurisy, pericarditis, acute exanthemata, erysipelas and acute articular rheumatism. It may also appear in the course of Bright's disease, pyæmia, endocarditis, typhoid fever, dysentery, otitis, ozæna and periostitis.

Pathological Anatomy.—In the acute form the pia mater is strongly injected and infiltrated with a purulent exudation especially upon the convexity of the hemispheres towards their internal portions. In other cases the inflammation is limited to the anterior lobes, to the fissure of Sylvius, or to the median fissure. The exudation is yellowish and thick, formed of pus globules, and finely granular fibrin, and fills the subarachnoid space (according to Klobe, the pus is furnished by the epithelium of the lower surface of the arachnoid.) The exudation is often especially abundant along the vessels. In the severer cases, the inflammatory products follow the fissures to the base, and extend both anteriorly and posteriorly. According to Bednar, the cerebellar pia mater may be affected in very young infants. The arachnoid is frequently opaque and covered with pus. The cortical substance is usually softened, discolored and infiltrated with pus. It is very frequently strewn with capillary hæmorrhages, and adheres so closely to the exudations which have formed upon the inner surface of the pia mater, that it is often impossible to detach them without tearing the brain.

Symptomatology.—Meningitis usually begins with fever and cerebral symptoms. The patient complains particularly of a feeling of heaviness in the head and violent cephalgia. The headache which is either diffuse or circumscribed, is often intermittent and develops slowly, until the advent of fever, weakness, vomiting and increased cephalgia indicate the onset of a serious disease. (Rosenthal.) In younger children there is restlessness, sleeplessness, strong pulsation of the fontanelles, without arching. In older children there is delirium or peevishness and moroseness. Vomiting is frequent; constipation is always present. In young children a slight convulsive twitching of the extremities is often observed, though the voluntary movements are in no way impaired; during sleep the eyelids are not entirely closed, the eyes frequently roll about slightly, the pupils are usually somewhat contracted. The children are very sensitive to light and sound; there is often great hyperæsthesia of the skin; slightest touch causing pain. The older children are either unable to walk from giddiness, or totter when they attempt to move; they complain of whistling and roaring noises in the ears, are indifferent to everything around them. The expression of the face is altered; there is a fixed look or a vexed, angry expression. The countenance frequently becomes distorted, the forehead wrinkled and moaning follows. The vomiting is obstinate even when the diet is carefully regulated.

After these symptoms have persisted with varying intensity for perhaps two or three days, the scene may be entirely changed in a moment by the sudden appearance of general eclamptic convulsions. The child loses consciousness, the gaze is fixed and entirely expressionless; the eyeballs roll about in every direction at first, then usually remain for a time turned upwards, often in a slightly convergent or divergent position. Then convulsive contractions of the muscles supplied by the facial appear, pointing of the mouth, grimaces, gnashing of the teeth and temporary lockjaw. The convulsion usually travels downward on one side of the body, involving first the upper and then the lower extremity of one side, then crossing to the other side and attacking its muscles from below upward. It does not follow this route, however. The spasms of the trunk are of a more tonic character while those of the extremities are clonic. Spasm of the glottis indicated by long drawn crowing inspiration, and impeded expiration, the immediate occurrence of cyanosis and powerful contractions of the diaphragm, provided it be free from spasm. Tonic inspiration of the inspiratory muscles will retain the thorax in the position of inspiration, so that the normal respiratory movements almost entirely disappear; when the diaphragm is seized with spasm, respiration stops entirely.

Clonic spasms of the muscles of respiration lead to rapid inspiration and expiration. Tonic contraction of the abdominal muscles is not rare, but clonic spasms are. The convulsions vary greatly towards the end of the attack, or vice versa, they continue in the extremities, but cease on the trunk, and the regular respiration is then re-established; or they cease entirely except in the head. Sometimes the attack lasts only five minutes, but it may continue for hours, alternately ceasing and beginning again, and the child may never recover from the convulsions. There is absolute unconsciousness during the entire attack. The pupils vary; frequently they are moderately distended during the attack, fixed and without reaction; they are often dilated to the maximum extent, and immovable; now and then a momentary rapid dilatation and contraction are observed. The pulse is very rapid, sometimes irregular and intermittent. The previously high temperature sometimes becomes excessive during the convulsion (104 F. and over) and afterwards returns to its previous point. Should death take place at this time, it is most apt to be caused by a disturbance of respiration. The interference with and suspension of the respiratory movements, caused by the tonic spasms, may produce such a condition of the blood that the excitability of the respiratory centre is lost; consequently the normal respiratory movements are not re-established on the cessation of the convulsions. If not fatal, the progress of the affection is marked chiefly by an aggravation of the cephalic symptoms, in which there are temporary remissions and improvements. The hydrocephalic cry is frequent, although it is not characteristic of the meningeal affection, as it is heard often in typhoid fever and in other affections. The children do not fix the eyes upon any object; they appear in many cases to see only instinctly, or not at all. There is pulsation of the fontanelle in small children, which, however, becomes weaker as the pressure from within increases; the fontanelles gradually arches outward, and is often very sensitive to pressure. Eclamptic attacks may terminate the affection; the children frequently die after a long series of irregular convulsions, which do not belong to any particular type, but attack at one time the muscles of the head, at another time those of respiration, and again those of the extremities; or convulsive attacks of milder grade and less importance may occur: gnashing of the teeth, rolling of the eyes, chewing or sucking or whistling movements which are continued for hours, winking of the eyelids. Convulsive twitchings of the extremities are quite common. All this time vomiting continues; the vomited matter rarely contains more bile than at an earlier period of the disease, but is composed of a slimy fluid, containing flocculi and an immense number of bacteria and vegetable organisms. The child rapidly becomes emaciated, the skin is mostly dry, perspiration occurring mostly on the head. Transitory circumscribed hyperæmias are very apt to follow slight injuries or blows, or pressure with the finger.

The patient gradually sinks into a condition of deep coma. During this stage, and sometimes even earlier, contractions of the extremities occur; there is often tetanic spasm of the muscles of the neck and extremities, so that the child can be lifted like a cadaver in which rigor mortis has set in. (Huguenin. Bednar.)

Diagnosis.—An accurate estimate of the previous history and etiology, in connection with the rapid onset and course of the disease are the leading features to be considered in the diagnosis. Indications of scrofula or tubercular disease in children in whom the symptoms are developed more slowly ought to give rise to suspicions of tubercular meningitis. A doubt between typhoid fever and meningitis during the first few days of the attack is not infrequent, but the differential diagnosis can be made subsequently by the appearance of the roseoloid rash, the enlargement of the spleen and the occurrence of bronchitis and diarrhœa; also by the exacerbation of the fever at evening, with a remission toward morning. It is not impossible to mistake meningitis for the so-called cerebral pneumonia at its commencement; this is obviated by a physical examination of the chest.

In brain affections depending upon uremia, which sometimes in infancy closely resemble meningitis, the characteristic suppression of the urine and the occurrence of dropsy are sufficient to prevent mistake. It is not always possible to differentiate the comatose form of simple meningitis from cerebral anæmia, but the fact that in meningitis the symptoms of fever are more marked than in cerebral anæmia may be sufficient to clear up the difficulty. (Steiner.) Cerebral hyperæmia and meningitis may be differentiated as follows:

CONGESTION OF THE BRAIN.	MENINGITIS.
There occurs instantaneously profound stupor, absolute immobility and insensibility, with dilatation of the pupils; or else acute delirium with difficulty of breathing, acceleration and smallness of the pulse; or in yet another class of cases with tremors or slight convulsive movements of one side of the body. Stuttering, loss of speech, stertorous respiration and pains in the arms and corresponding side of the face exist; the fingers do not retain objects which the child attempts to grasp.	The first symptom is generally headache, which is not noted in congestion. The alterations of motion and intelligence, occur early, but not before the beginning of the first or second day, while in congestion the appearance of delirium or coma, or subsultus tendinum, or partial paralysis, is instantaneous, frightful, truly apoplectic, and so far as ascertained, not accompanied by vomiting—a symptom rarely absent in meningitis.

Prognosis.—Recovery is an exceptional result in this disease, death being the rule. The prognosis is therefore almost always unfavorable, though the possibility of recovery must be conceded. If recovery from simple meningitis should occur, it is unlikely to be complete, for there will probably remain behind some lesion of the motor or mental functions.

Treatment.—The leading symptom being headache, *Belladonna* will usually be the first remedy, although if the fever is high and general, *Aconite* may precede it to advantage. During the course of the disease, for the stages of inflammation, turgesence, effusion and absorption, we may have to give: *Bryonia*, *Gelsemium*, *Hyoscyamus*, *Opium*, *Stramonium*, *Sulphur*, or *Æsculus*, *Glonoine*, *Camphor*, *Cantharis*, *Cimicifuga*, *Cina*, *Cocculus*, *Cuprum*, *Digitalis*, *Helleborus*, *Lachesis*, *Lachnanthes*, *Mercurius*, *Tartar emetic*, *Veratrum viride*, but especially *Apis*, or *Glonoine*.

Lilienthal says: Meningitis of children requires: *Aconite*, *Belladonna*, *Cina*, *Helleborus*, *Lachesis*, *Mercurius*; or, *Apis*, *Glonoine*.

If caused by sunstroke: *Arnica*, *Belladonna*, *Gelsemium*, *Scutellaria*, *Veratrum viride*; or *Camphor*, *Glonoine*, *Lachesis*, *Theridion*.

If due to suppression of erysipelas, or some other eruption, such as scarlatina: *Belladonna*, *Rhus*, *Apis*, *Lachesis*, *Mercurius*, *Phosphorus*. If due to suppression of otorrhœa, give *Pulsatilla* or *Sulphur*. If caused by cold, or a mere cold in the head: *Aconite*, *Bryonia*, or *Arsenicum*, *Hyoscyamus*.

If meningitis threatens to pass into hydrocephalus, give *Belladonna*, *Bryonia*, *Helleborus*, *Apis*, *Arnica*, *Apocynum can.*, *Digitalis*, *Cina*, *Conium*, *Hyoscyamus*, *Opium*, *Stramonium*, *Veratrum viride*. See Hydrocephalus.

The particular indications are as follows:

Aconite.—Inflammatory fever, with great restlessness, delirium; violent burning pains through the whole brain, especially in forehead; red and bloated face, red eyes; burning as if the brain were moved by boiling water, full of anxiety and fear of death.

Æthusa cyn.—Coma, with eclampsia and tetaniform convulsions; unconsciousness; dilated pupils; staring eyes; pressing pain in forehead, as if it would split, with violent vomiting of milk or ingesta and diarrhœa, red spots on cheeks, pulse small, hard and frequent, with cold skin.

Ant. tart.—Severe vomiting, with fainting, followed by deep sopor, with constant jactitation of the extremities; followed by partial or general convulsions, with small filiform pulse, and decrease of all bodily heat. Cold clammy sweat.

Apis mel.—Meningitis from suppression or spread of erysipelas, or other exanthemata. Congestion to head and face, with fullness, burning and throbbing in brain. Stage of effusion.

Arnica.—Heavy sleep, with nervous twitching, constant dreaminess; heat and redness of face, simultaneously with coldness of the body; contraction of pupil; involuntary defecation and micturition; pulse full, strong; stertor. Traumatic meningitis, with serous or bloody extravasations.

Belladonna.—Red and bloated face; boring with the head into the pillow; sensitiveness to light and noise; or for violent burning and itching pains in the head; red sparkling eyes, with furious look; sopor, with distorted and half-opened eyes; heat in the head, with violent throbbing of the carotids; swelling of the veins of the head; loss of consciousness and speech, or muttering; violent delirium; convulsive movements of the limbs (right side); spasmodic constriction of the throat, with difficult deglutition and other hydrophobic symptoms; vomiting; involuntary discharge of urine and fæces.

Bryonia.—The stage of excitement is merging into that of depression or stupor: constant sopor, with delirium; livid face; heat about the head; great thirst; sudden starting from sleep, screams and cold sweat on forehead; more or less constant motion of the jaws, as if chewing something; constipation.

Cicuta.—Eclampsia, with pale face; incomplete coma; convulsions begin by turning the head towards the shoulder; bad effects from concussion of the brain when spasms set in. Epidemic meningitis.

Cina.—Stupefying headache, especially in forehead, then also in occiput; vomiting, with clean red tongue; discharge of worms by the mouth or rectum; milky, white, scanty urine; sudden distressing cries in sleep; child cross and peevish. No appetite; refuses food.

Gelsemium.— Excruciating headache, with nausea, giddiness and blindness, giving rise to intense and overwhelming congestion of the brain in children, during the period of dentition; coup de soliel.

Glonoine.—Meningitis from sunstroke; throbbing headache, aggravated by shaking the head, and attended with great quickness of pulse; headache ascending from below upwards and from within outwards, with feeling as if the brain were swelling or getting too large; intense red face; redness of the eye, with soreness of the globe of the eyes.

Hepar sulph.—Traumatic meningitis with spasms; stage of effusion.

Hydrocyanic acid.—Headache with vomiting, agitation, pulse feeble, unequal and frequent; respiration unequal; convulsions of face, eyes, and extremities, pupils dilated or contracted, dimness of sight, changeable deliria.

Hyoscyamus.— Stupor, loss of consciousness, delirium; singing, muttering, smiling, grasping at flocks, sudden starting; watery diarrhœa; red face, with staring look; aggravated by light or bright objects.

Lachnanthes.—Fever with circumscribed redness of the cheeks and brilliant eyes; restlessness, wakefulness, whining, on account of headache; sensation as if the vertex were enlarged and driven upward; wry neck.

Opium.—Deep coma, stertorous breathing, with eyes half closed, and stupefaction after waking; great heaviness of head, with dull, stupid look, as if drunk; frequent vomiting, complete listlessness and dullness of sense, the patient not desiring nor complaining of anything. Stage of great stasis.

Pulsatilla.—Meningitis from suppressed otorrhœa, or other discharge.

Stramonium.—Feverish heat, red face and moist skin. The sleep is almost natural, with twitching of the limbs, moaning, tossing about absence of mind after waking, or staring look; slow and shy retreating, or desire to escape, with screams; frightful visions.

Veratrum viride.—Sunstroke; fullness, weight or distension of the head; giddiness; intense headache, with fullness and throbbing of the arteries, sometimes with stupefaction; increased sensitiveness to sound, with buzzing, roaring, etc.; double, partial, luminous, painful, dim, or otherwise disordered vision; nausea and vomiting; tingling and numbness in the limbs; mental confusion, loss of memory; convulsions or paralysis of motion. See other forms.

TUBERCULAR OR BASILAR MENINGITIS. ACUTE HYDROCEPHALUS.

This is an inflammation of the meninges arising from derangement of the lymphatic system. By tuberculosis is meant that disease which is attended necessarily by the formation of miliary tubercle. Inflammation of the brain and its membranes occurring as a consequence of the progress of tuberculosis is called Tubercular Meningitis. The term tubercle literally implies a little swelling, and in this sense it still serves to distinguish a class of skin diseases. As applied to the peculiar deposits so frequently found in the lungs and other organs it now means not only those products when they present a tubercular form, but when they are infiltrated in masses, or exhibit appearances wholly opposed to the original signification of the word. At present, by tubercle is understood a peculiar morbid deposit, sometimes gray, but more frequently of a yellowish color, varying in size, form and consistence, which sometimes softens and causes ulceration in the surrounding textures, but which at others, dries up, becomes cretaceous, and produces induration and cicatrization. It assumes four forms:

Miliary tubercle, when the morbid deposit is scattered throughout an organ, or on the surface of a membrane, in isolated grains like millet seeds. Sometimes they are sprinkled indiscriminately throughout a tissue; at others, they are in groups or clusters more abundant in one part than another. Occasionally they are minute, of grayish color, semi-transparent, and hard to the feel, the so-called *gray gran-*

ulations of Bayle. More frequently they are of a yellow color, about the size of a millet or mustard seed, and of soft consistence, so that they can be easily crushed between the fingers. In consistence they may vary greatly, being sometimes hard, or, as they are then called crude, or they may be so soft as to resemble cheese and cream.

Infiltrated tubercle occurs in diffuse masses, varying in size from that of a bean to that of the entire organ affected. Masses are frequently formed by the agglomeration or condensation of miliary tubercle. Like it also, this form of the deposit may be gray or yellow, crude or soft.

Nodular and Encysted Tubercle.—This form exists in roundish isolated masses, varying in size from that of a small pea to a bean. It may present all the characters of the other forms, but is frequently seen to be surrounded by a capsule. more or less dense, of fibrous tissue. Each of these forms may undergo a cretaceous or calcareous transformation, and is then distinguished by its white appearance and its putty-like, gritty, or stony consistence. All these forms of tubercle run into one another, and may exist in the same individual, and often in the same organ, especially in the lungs.

Tubercle has been made the subject of special chemical analysis, from which the following conclusions may be drawn. 1. That it consists of an animal matter, mixed with certain earthy salts. 2. That the relative proportion of these varies in different specimens of tubercle, *i. e.*, recent and chronic. 3. That the animal matter consists principally of albumen, occasionally mixed with a small amount of fibrin. Fat also exists to a slight degree, and becomes more abundant as a constituent as the disintegration of tubercle progresses. 4. The earthy salts are principally composed of the insoluble phosphate and carbonate of lime, with a small proportion of soda. 5. That very little difference in ultimate composition, has yet been detected between tubercle and other albuminous compounds. From the preceding structure and chemical facts, tubercle must be regarded as a morbid product, having a very low degree of vital power, seldom proceeding beyond an imperfect degree of nuclear formation and having a constant tendency to fatty or mineral degeneration. (Bennett.)

Etiology.—The leading cause is stasis of the lymphatic current either from hypertrophied or atrophied glands. Tuberculosis is almostwithout exception derangement of the lymphatic system (see page 551). Pathological anatomy shows it to be characteristic of so-called scrofulous mal-assimilation in which all inflammatory processes show no inclination to absorption nor to an active formation of pus, but on the contrary, a tendency to retrogressive meta morphosis, which to the naked eye offers the appearance of cheesy degeneration. The reason of this behavior is not yet explained; let it suffice to mention the long proved fact that the product of scrofulous inflammation is exceptionally short lived, a fact which seems to hinder a normal elimination of the cellular element. Rindfleisch gives it as his opinion considering the size of the cells of the product of scrofulous inflammation, that these have a tendency to increase in size on their way from the vessels through the cellular tissue, to swell by intussusception of substances rich in albumen, but meanwhile during this process of swelling, to die, and gradually to disintegrate where they are. Let this be as it may, it is at all events certain that the scrofulous infiltration has a character entirely its own; that in it takes place neither the normal purulent melting, nor an absorption, nor an organization into cellular tissue; on the contrary, it stiffens the cellular tissue into a tough compact mass, gray by transparency, rendering impossible the passage of blood through the blood vessels. Thus is the alimentation of the infiltrated substance suspended, and this undergoes a sort of dry necrosis, which appears to the naked eye, as a cheesy degeneration, beginning in the centre, and advancing outward. It is not necessary that the individual should have the outward marks of scrofula; this, however, is necessary; that in him there should exist that tendency to bring inflammatory exudations to a low cheesy degeneration. It is then easily understood that all sorts of acute diseases which cause a great number of inflammatory lesions lead in the case of individuals with a disposition to scrofula (lymphatic constitution,) to dead cheesy exudations, instead of leading to such as simply suppurate, or become indurated, or are absorbed. Whooping cough and pneumonia, or catarrh following measles, simple catarrh, and broncho-pneumonia of children, are then capable of rendering the bronchial glands cheesy, it would be better to say tuberculous, by the absorption of degenerated exudation (page 555.) Catarrh of the small intestine receives in the case of a child with this tendency, a specific modification, so that from this begins tuberculosis of the mesenteric glands (page 556.) Typhoid can deposit in the bronchial mucous membrane and in the lungs infiltrated matter which leads to the same result in regard to the bronchial glands. Traumatic lesions of the extremities, of the bones, of the periosteum, of the joints lead to the same result, since the inflammatory exudation, in the case of a child with this tendency, enters upon the abnormal transformation already mentioned. It is not therefore sustaining a paradox to say that miliary tuberculosis of the pia mater may be caused by a blow, or by a spontaneous inflammation of the periosteum of the extremities. In some cases traumatic accidents, preceded, and stood in such evident connection with the beginning of the illness, that it was impossible to deny to these the causative role.

The scrofulous or lymphatic temperament is often developed under the influence of unpropitious surroundings. In this respect the nutrition of children is of deep importance; deprivation of mother's milk bringing up with unfit nourishment rich in starch; deprivation of good air occasioned by unsanitary conditions of lodging, all cause a slumbering tendency to be aroused. (Huguenin.)

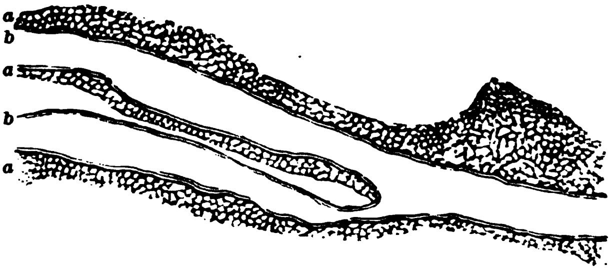
Rilliet and Barthez state that the disease is very rare in the first year of life; that it becomes notably more frequent in the second year, but that it is between two and seven years of age that it occurs with the greatest frequency. After this it diminishes, they say, from eight to ten, and especially from eleven to fifteen years of age. The influence of sex has not been determined, but it appears probable that boys are somewhat more subject to it that girls. It has been clearly shown by the observation of various writers that the disease usually attacks delicate children, and especially those born of parents who are either themselves laboring under tuberculosis, or in whose families that diathesis has existed to a greater or less extent.

The cause of the disposition on the part of the tubercular diathesis in children to localize itself in the brain is to be sought for in the physiological condition of the lymphatic, circulatory and nervous systems, in early life, being that of great functional energy and nutritive activity. (Barrier.)

Pathological Anatomy.—The characteristic lesions of tubercular meningitis, are:

1. The pia mater is dotted with miliary tubercles.
2. The pia mater shows inflammatory changes.
3. The ventricles are dilated, and contain a hydrocephalic effusion, (hydrocephalus.) This latter is wanting in some cases.

When the pia mater is carefully stripped from the brain, the tubercles appear as grayish-white nodules having a partly gelatinous appearance, and always situated in the immediate neighborhood of vessels; they are very variable in size, some being scarcely visible to the naked eye, while others are as large as a poppy or a millet-seed and finally masses, as large as a pea, are found, which have been produced by the confluence of smaller nodules. The distribution varies greatly, but it must be particularly borne in mind that the tubercles are always to be found close to the vessels. In some cases the whole length of an artery, from its origin in the circle of Willis, is covered with numerous tubercles, while in other rare cases, the granulations are chiefly seated on the peripheral branches in the superficial parts of the pia. These granulations are not found upon all portions of the brain equally in cases of tubercular meningitis. On the contrary, they are rarely present upon its convexity or lateral aspects, while they are uniformly present at the base. Often the tubercles are limited to particular portions of the surface of the brain, such as both frontal and both parietal regions; when the arteries are dissected out



a a a Lymphatics alongside blood-vessels *b b*.

Lymphatic vessel with gland bursted by inflammatory infiltration.—(DANFORTH.)

it is not difficult to see that the territory supplied by the arteries of the fissure of Sylvius and corpus callosum on both sides are affected. Or the new growths may be most abundant in the pia covering the upper and under surfaces of the cerebellum, or on the median surface of the hemispheres, or on the posterior lobes of the brain. In addition to the tubercles of fresh formation, traces of older processes are occasionally found. Old callosities composed mainly of connective tissue may exist, enclosing caseous miliary tubercles. (Huguenin.)

The deposition of tubercles precedes the occurrence of the inflammatory changes in the meninges. The inflammatory lesions vary between mere vascular injection, infiltration with clear, turbid or gelatinous liquid, and abundant formation of lymph. When the inflammation has gone beyond mere sanguine injection, there is infiltration of the membrane with the products of inflammation, viz., lymph and pus. The suppuration is characterized by cloudy patches in the pia, particularly along the vessels, and by marked swelling of the whole tissue. There are extravasations of blood in the pia and this membrane is adherent, to the brain more or less, so that in tearing it off, portions of the cineritious substance which is itself softened, come with it.

After the changes in the pia mater, the most important anatomical feature is effusion within the ventricles. This was formerly thought to be the essential lesion of the disease, but recent researches have shown that it is absent in some instances which have followed in all respects the ordinary course of the malady. The character of the fluid varies in different cases. It is white limpid or transparent, or may hold in suspension albuminous or purulent flocculi. In some rare cases it is sero-sanguinolent. Softening of the substance of the brain is of frequent occurrence and there is also evident congestion manifested by a dotted redness of a general rosy tint. (Meigs & Pepper.)

Symptomatology.—Loss of flesh is the most constant precursor; indeed is almost constant; often the first, sometimes the only symptom; the child's face being very much spared, it is when the nurse comes to undress him that she finds the limbs to be losing their roundness and the flesh to feel flabby. This loss of flesh mostly proceeds continuously; sometimes the child will seem to pick up for a time and afterwards begins to waste again. Loss of color concurs; it is sometimes masked by a false color in the cheeks due to permanently dilated capillaries; it may be only now and then that this color leaves the cheeks, and then the real paleness becomes obvious. The child is drowsy by day and restless at night; he is easily tired, and in the midst of play will lie down on the floor and fall asleep for a short time; at night he grinds his teeth, sleeps with his eyes half-open, starts and cries out; he is sad, fretful, peevish, taciturn and wants to be let alone. If for any reason a young child has been put to bed for a day or two he will not take to his feet again. Headache is frequently absent, rarely a prominent symptom, but mostly present to a certain degree, very young children will be observed to put their hands to their heads, and to toss their heads on their pillows; older children will say their heads ache, and this especially after some exertion of mind or body; a child will go to school and come home complaining of his head; the headache is rarely severe and mostly frontal; a strong light increases it. Feverishness is not always present; when it is present it is noticed chiefly in the evening. These symptoms are grouped in every manner possible; any of them may be absent, and how many soever may be present they do not justify more than a fear lest the condition should terminate in tubercular meningitis. They are sometimes due to progressive tuberculosis, but sometimes certainly to a catarrhal state or to simple nervous depression. The pyrexia is the most important symptom. When a child suffers day after day, from a slight elevation of temperature above the normal, that elevation of temperature may be due to tuberculosis. Inasmuch as a catarrhal fever does not usually last longer than ten or twelve days; if the pyrexia do last longer than that time, and if the presence of continued fever or a local inflammation can be excluded; the elevation of temperature is very probably due to tuberculosis. The poorliness which follows acute specific or other diseases often passes uninterruptedly into the premonitory period of tubercular meningitis. Measles is the most common antecedent, hooping cough next, occasionally an attack of diarrhœa and vomiting, bad sore throat or hip disease.

The stage of invasion of tubercular meningitis is the period at which there occur such new symptoms as enable the physician to declare positively that from this date the child has sickened with hydrocephalus. The invasion symptoms are the first which make the friends of the child think him dangerously ill; the poor as a rule only now begin to seek advice. (Gee).

Vomiting is generally the first and most important symptom, and convulsions are next in importance, but these two may be associated or appear alone. Marshall Hall says, "Never, never allow vomiting in an infant to pass without paying the utmost attention and making the strictest inquiry in reference to the functions of the brain." Vomiting may be frequent and is nearly always accompanied by an aggravation of the symptoms of the premonitory stage. Headache and increased temperature are present and are very decided evidences of the gradual development of the trouble. (Hamilton).

The vomiting of the invasion is ordinarily repeated several times. Sometimes the symptom is very urgent, occurs whether food has been taken or not; and this may be so every day for a week. When once the tendency to vomit has ceased for twenty-four hours it does not ordinarily recur. In the great majority of cases the bowels are constipated throughout the whole course of the disease; yet sometimes they are spontaneously relaxed. Retraction of the abdomen is a symptom which will be met with at some time or other in nearly every case; sometimes present for a day or two only, and at no certain period; sometimes present all along. Acute diseases affecting the brain are the only acute diseases of children, which as a rule, cause great excavation of the belly. (Gee).

This condition is produced by a permanent spasmodic contraction of the transversalis and oblique abdominal muscles, in which the coat of the intestines probably participates for the intestinal tube is always found remarkably contracted. A certain degree of hardness and tension always remains in the abdominal parietes, even when this trough-like formation of the belly is extreme. On the other hand a paralysis sometimes ensues in the last days of life when the rigid depression of the abdomen disappears, and the retracted abdominal walls becomes again soft and flabby. The case is different with the integument covering the abdominal walls, as may be seen when a fold having been raised by pinching with the thumb and finger, takes a long time to disappear. (Vogel).

At this time a symptom may be noticed which has been remarked by Trousseau and called by him the *tache cerebrale* or *tach meningitique.* It is a red line or spot remaining upon the skin of the forehead when the finger has been drawn across it. The skin continues dry, the face is sometimes flushed, and the head often hot; and though these symptoms vary much in their duration, coming and going without any evident cause, yet there is a permanently increased pulsation of the carotids, and if the skull is not ossified the brain may be felt and seen forcibly beating through the anterior fontanelle. In cases where the fontanelles are already closed a peripheral circulation of the veins of the scalp is sometimes rapidly developed, the result of pressure by the effused fluid upon the sinuses of the dura mater. The child is now very averse to being disturbed and often lies in a drowsy condition, unless spoken to, when, if old enough to answer it usually complains of its head, or of weariness or sleepiness. Its replies are generally rational but very short and if it needs anything it asks in as few words as possible in a quick, pettish manner and shows much irritability if not at once attended to. At other times it lies with its face turned from the light, either quiet or moaning in a low tone of voice and now and then uttering a short, sharp, lamentable cry, the hydrocephalic cry, but making no other complaint than the low moan and the occasional plaintive cry. To this there are exceptions, and children sometimes scream with the intensity of the pain, or cry out "My head! my head!" As night comes on there is almost always a distinct exacerbation of the symptoms, and the quiet of the day is frequently succeeded by a noisy and excited state, in which vociferous cries about the head alternate with delirium. The child sometimes keeps its eyes so firmly closed that we can scarcely see the state of its pupils. Usually they are not much affected, but sometimes one is more dilated and acts more sluggishly than the other, or in other cases, strabismus exists, though perhaps in a very slight degree, or, confined to one eye.

The transition of this to the last stage is sometimes effected very gradually by the deepening of the state of drowsiness till it amounts to a stupor from which it is impossible to arouse the child. At other times this stupor comes on very suddenly succeeding to an attack of convulsions. The convulsions usually affect one side more than the other, and after the fit has passed off, one side is generally found partially or completely paralyzed, while the child makes constant automatic movements with the other, carrying the hand to the head, and alternately flexing and extending the leg. The side which is most affected during the fit is generally though not invariably the most palsied afterwards. The child lies upon its back in a state of complete insensibility, with one leg stretched out, the other drawn up toward the abdomen. The tremulous hands are either employed in picking the lips or nose till the blood comes, or one hand is kept on the genitals while the other is rubbing the face or head. The head is at one moment hot, and the face flushed, and then the heat disappears and the flush fades, though usually there is a permanent increase of temperature about the occiput. Sometimes the skin is dry, and then though the extremities are cold, a profuse sweat breaks out on some parts of the body or on the head. The pulse often loses its irregularity, but at the same time it grows smaller and more rapid, till at length it can be counted only at the heart. The eyelids close only partially and in most cases there is some degree of strabismus. The child often makes automatic movements with its mouth as though chewing, or as though endeavoring to swallow something.

An attack of convulsions at this time puts an end to the painful scene, but often the child lives on for days though wasted to a skeleton. The head is somewhat retracted and the child bores with its occiput in the pillow; the eyelids are wide open, and the eyes turned upwards so as to conceal three-fourths of the iris beneath the upper lid, while the countenance is still further disfigured by a horrible squint, or by a constant rolling of the eyes. One leg and one arm are stiff and motionless, the other in constant spasmodic movement, while the hands are often clenched and the wrists bent upon the forearm. Cold clammy sweats break out upon the head, respiration is labored, deglutition is difficult, the child almost choking in its effort to swallow or allowing the fluid to run out of the corners of the mouth. The recurrence of convulsions ends the patient's sufferings.

Meningitis of the Convexity.—No doubt tubercular meningitis usually affects the base of the brain; but it is equally certain that this is not always the case. And inasmuch as the most characteristic symptoms of ordinary tubercular meningitis are in fact the symptoms of basilar meningitis, it follows that when the meningitis is not basilar, it is not attended by those symptoms. That is to say, the vomiting of the invasion period, the constipation, the infrequent and irregular pulse, the unequal pupils, the strabismus and other local paralyses, are absent from meningitis which does not involve the base of the brain. A state in which general convulsions are either present or imminent, the intervals between the convulsions being occupied by tremblings and twitches of the limbs and face, turning of the thumbs in upon the palms, clenching of the fists, stiffness of the back, neck and limbs—in short, a convulsive state, which is constant (except perhaps quite at the close of the disease) this is the most prominent symptom of tubercular meningitis of the convexity. Add moderate pyrexia, and a pulse which is frequent and very variable in its frequency. The clue to diagnosis is to be found in the acuteness of the disease, the convulsive state, and the constant pyrexia, the evidences of basilar meningitis, and of cerebral abscess being wanting. Meningitis of the convexity runs a more rapid course than meningitis of the base; two weeks, one week or even less, commonly see the fatal termination, while the duration of basilar meningitis is about twenty-one days.

Secondary Tubercular Meningitis.—Meningitis is called secondary when its symptoms have been preceded by manifestations not to be doubted of tuberculosis elsewhere. With this condition, the onset of the meningitis is, as a rule, obscure. It is uncommon for meningitis to supervene upon chronic phthisis in children; when this does happen, the new disease is the more easy of diagnosis the more chronic the precedent disease. Contrariwise meningitis which occurs in the course of acute tuberculosis of the pulmonary form is mostly latent; when not so, very rapid in inducing death. (Gee).

Diagnosis.—The diseases with which tuberculosis of the meninges is most likely to be confounded are simple meningitis and typhoid fever. It might also be confounded, though this is much less probable with the cerebral symptoms which complicate the exanthemata and some local diseases, especially pneumonia. Acute gastritis causes symptoms which are almost identical with those of the earlier periods of tubercular meningitis. Typhoid fever resembles not so much tubercular meningitis as acute tuberculosis. But typhoid fever and acute tuberculosis are immediately fatal by way of meningitis.

Prognosis.—The gravity of tubercular meningitis is not surpassed by any other disease.

Treatment.—The functional derangement of the reabsorbent system (p. 535) being the predisposing cause whatever may be the exciting cause this system should receive our first attention. Remove the obstruction and the chances of lessening the inflammation and hastening absorption are greatly enhanced. At the head of the remedies stand *Belladonna*. The symptoms may, however, call for *Belladonna*, *Bryonia*, *Chamomilla*, *Cina*, *Ignatia*, *Ipecac*, *Pulsatilla*; when the tubercular meningitis is fully established then we may need for the first stage, *Aconite*, *Belladonna*, *Glonoine*, *Hyoscyamus*, *Stramonium*, *Zincum;* second stage, or that of effusion, *Apis*, *Apocyanum*, *Artemesia*, *Belladonna*, *Cina*, *Digitalis*, *Helleborus*, *Hyoscyamus*, *Mercurius*, *Rhus*, *Stramonium*; third stage, *Apis*, *Opium*, *Argentum nitricum*, *Indigo*, *Ipecacuanha*, *Moschus*.

Aconite.— When there is marked febrile excitement, great heat and dryness of the skin, nervousness, and fearfulness.

Apis mel.— Puffy face; the child screams out very sharply and shrilly during sleep or when awake, especially during the latter part of the night; *cri encephalique;* great restlessness at night; profuse sweat on head of a musklike odor; squinting; grating of teeth; trembling of limbs; irregular small pulse; urine scanty, though it may be profuse; cerebral depression.

Apocynum can.— Sutures opened; forehead projecting; sight of one eye totally lost, the other slightly sensible, stupor; constant involuntary motion of one leg and arm; urine suppressed.

Argentum nitr.— Last stage; convulsions, with great restlessness between the attacks, or every successive spasm is announced by a very marked degree of restlessness.

Arsenicum.— Anæmic cases; great depression of the vital forces, manifested by great prostration; emaciation; pallor; thirst; sometimes the child strikes its head with its fists, as though for temporary relief.

Artemisia vulg.— While the left side is paralyzed, the right is in a state of clonic spasm; the child lies in a sleepy or dreamy state, and yet will drink large draughts of water, without being entirely aroused; surface of body cold, involuntary stools.

Belladonna.— High fever, with dry burning heat of the whole body, severe burning thirst, beating of carotids, stormy beating of heart; full, strong, quick pulse; sleeplessness or sleep full of anxious dreams and fright when awaking; deliria; vertigo when rising up, with nausea and vomiting, passing off when lying down; bright shining eyes, visions; pupils contracted or dilated, blindness; severe headache, as if the head would burst, with pain at every motion and purring in ears; almost constant moaning; convulsions; the child lies in a drowsy or semicomatose state, is constantly starting and jumping, bores its head backward into the pillow, and tries to bend its body backward.

Bryonia.— As soon as symptoms of exudation appear, with almost constant motion of the jaws, as though the child was chewing something; lips dry and parched; stools very dry and hard or constipation; the least motion produces nausea and faint feeling.

Calcarea carb.— Lymphatic children; anterior fontanelle wide open; head very large; copious perspiration on head and upper part of body; frequent screaming without cause; difficult dentition.

Calcarea phosph.—Posterior fontanelle wide open; bones of skull thin and friable; screaming and grasping the head with the hands; head totters; squinting as if from pressure; eyeballs distended and protruding; ears and tip of nose cold; face pale, sallow, yellowish.

Cimicifuga.—Delirium and wild fancies; intense pressing and throbbing in vertex and occiput; feeling as if brain were too large, and as if the top of head would be forced out; pain in the eyes.

Cina.—Constant whining and moaning; the child cries piteously if one takes hold of it or carries it; vertigo; loss of consciousness; the child frequently bores into the nose so long that the blood comes; face pale and cold; paroxysms of spasmodic twitching of the body, followed by trembling of the whole body.

Cuprum acet.—Metastasis during an attack of catarrhal or exanthemic fever; stage of exudation; deliria, with loud screaming, precede the sopor; convulsions begin at the periphery and extend upwards; great stiffness of the neck, with remarkable paleness of the skin; pressure in præcordial region and sunken-in abdomen; great irregularity of the pulse, sinking sometimes deep below the normal state; trismus; tetanus; cramps; grinding of the teeth; inability to hold the head up.

Gelsemium.—First stage; catarrhal fever, with predominant nervous symptoms; vertigo and blurred vision; cannot hold the head erect; dull stupefying headache; pulse slow, soft and full, or weak; no thirst.

Glonoine.—Intense, cerebral exaltation (*Apis* depression); head feels larger, can hardly keep the head erect; confusion; faintness; black spots before eyes; wants to keep head perfectly quiet; *cri cerebral;* spasmodic vomiting; alternately flushed and pale face; convulsions; heavy sleep, difficult to awaken.

Helleborus is chiefly indicated when all reaction is past, and we deal with the consequent paralysis. Diseases of the serous membrane, approaching insidiously, rather as a sequel of some other disease than as the natural termination of an inflammation of the brain; rigidity of the muscles of neck and limbs; strabismus; dilated pupils; wrinkled forehead, which is bathed in a cold sweat; soporous sleep, with screaming spells; dryness of nostrils; the lower jaw hangs down, or chewing motion of the jaw; urine scanty and dark, depositing a sediment like coffee-grounds; involuntary throwing or whirling about of one arm and one leg; rubbing of the nose; the child drinks water greedily.

Hyoscyamus.— Delirium; jerking of limbs; watery diarrhœa; red face; wild, staring look; throbbing of the carotids; indistinct speech; picking at the bed-covers; distorted eyes, with diplopia; convulsions; frothing at the mouth.

Lycopodium.— In delicate, anæmic children; heaviness of head; stupefaction; convulsive motions of head, face, and extremities; hemiopia or amblyopia; coldness of face or of the whole body; indistinct speech and heaviness of the tongue; sleepiness; screaming out in sleep delirious words; frequently indicated after *Calcarea* when the erethic symptoms are followed by deep coma.

Mercurius sol.— Spongy condition of the gums; salivation; glandular enlargement; slimy or clay-colored stools; cold and clammy sweat upon thighs and legs, especially during night; moist tongue, with great thirst; child very sensitive to pressure on lower abdomen and epigastrium.

Opium.— Indicated in early and late stages; heavy and stupid sleep, with red face; stupid even after waking; extremely acute hearing; constipation or stools resemble small black balls.

Phosphorus.— Child dull and inclined to sleep all the time; vomits drink as soon as it becomes warm in the stomach; coldness of feet and legs.

Pulsatilla.— Sequelæ of measles; is unable to raise the head or to carry it erect; obscuration of sight, with inclination to vomit and paleness of the face; alternate redness and paleness of face; nervousness; easily startled; children worry, fret, and cry, and cannot sleep; the child seems sometimes improving, and then worse again; craving for fresh air.

Silicea.— Small, active children; the child grasps at its gums continually as though they were painful; profuse sweat about the head at night.

Stramonium.— Great loquacity; merry delirium; desire to escape from the bed and room; grinding of teeth; glittering eyes; staring look; dark-colored stools; during the convulsion the head is jerked up from the pillow, and falls back again alternately.

Sulphur.— Sequelæ of other diseases, *e. g.*, a chronic skin disease, or of an otorrhœa, caused the gradual appearance of the disease; a psoric diathesis prevents the little patient's recovery; head falls backward, prefers to lie with his head low; face pale or red; qualmishness when raising head; sour breath; urine as if mixed with flour; swollen gums; blisters in mouth, with burning pains; pain in swallowing, with redness and swelling of tonsils and uvula; pain in nose, which is swollen and ulcerated, with discharge of yellow sticky fluid; flashes of heat and sinking spells about the middle of the day; great hunger, redness and excoriation around the anus; constant sleepiness, but only sleep in short naps. Child dreads to be bathed.

Veratrum album.—Great inequality in the division of heat; skin cold and clammy; vomiting and aggravation of all symptoms when raising himself up, and comparatively well-feeling in horizontal position; the least motion produces nausea and vomiting; loss of all strength in extremities; stiff neck, great tendency to convulsions; great thirst for ice-water or ice; disfigured pale face, or redness of one cheek; great prostration after a stool. Compare *Arsenicum.*

Veratrum viride.—Fullness and heaviness of head; vertigo, severe headache, unconsciousness; oversensitiveness of hearing, with roaring in ears; strabismus, visual disturbances; nausea, vomiting; loss of memory; convulsions, the child bends its body far backward, amounting to opisthotonos, during a spasm (also *Belladonna*); very quick pulse; skin shrivelled; cold sweat on face, hands, and feet; paralysis.

Zincum.—From spinal congestion. The child has its feet in constant motion; distension of abdomen; constipation, with hard and dry fæces; on awaking the child gives signs of fear, and rolls its head from side to side; cries out, starts, and jumps during sleep.

The remedy should be carefully selected and perseveringly adhered to for days. See meningitis of other varieties.

CEREBRO-SPINAL MENINGITIS. CEREBRO-SPINAL FEVER. SPOTTED FEVER. CEREBRAL TYPHUS. PETECHIAL FEVER. MALIGNANT PURPURÆ.

This is an acute, epidemic disease, characterized by profound disturbance of the central nervous system. It is defined by the Royal college of physicians to be "a malignant epidemic fever, attended by painful contraction of the muscles of the neck, and retraction of the head. In certain epidemics it is frequently accompanied by a profuse purpuric eruption and occasionally by secondary effusions into certain joints. Lesions of the brain and spinal cord and their membranes are found on dissection."

Epidemic cerebro-spinal meningitis is observed in three diff forms: (1). Simple, in which the symptoms indicative of disorder of the nervous centres predominate throughout the whole course of the disease. (2). Fulminant, in which the depressed state of the vital powers with profound blood change—as shown by hæmorrhage of various forms into the cutis—characterizes the disease; and (3). Purpuric, in which the cerebro-spinal symptoms and the symptoms which mark blood change (petechiæ purpuræ, vibices, etc.,) and flagging of the vital powers occur together. An abortive form is also recognized, the term being given (1) to certain anomalous symptoms observed in communities among which the disease is active; and (2) to sundry symptoms characteristic of the malady, but of transitory duration; such as severe cephalalgia, a sense of dragging at the back of the head, or actual slight retraction of the head; cardialgia, enteralgia—these symptoms often ending contemporaneously with the appearance of profuse perspiration, or epistaxis.

Anatomical Appearances.—The essential anatomical characteristics of the disease found after death are hyperæmia, often intense of the pia mater of the brain and spinal cord; with more or less intense subarachnoid and interstitial effusion into the meshes of the congested pia mater, either of serum, or of a transparent gelatinous material or of purulent matter; the latter more frequently than either of the two former. The purulent effusion is of greenish or yellowish color and is sometimes flaky. The extent to which these appearances are observed and the amount of effusion varies greatly in different cases. No part of the encephalic or spinal pia mater and arachnoid may be free, or certain portions alone may be affected; but effusion is limited to the subarachnoid space, and does not occur into the subarachnoid cavity.

The brain and spinal cord is usually gorged with blood, unless death has taken place late in the course of the disease. The visceral arachnoid is opaque and where the eye detects opacity alone, the microscope reveals extensive cell formation, purulent in character. Softening of some portion of the spinal cord has sometimes been observed.

Symptomatology.—In the majority of the cases before the onset of the disease the patient suffers from more or less indisposition. There are discomfort in the head, neuralgic pains in the back, the principal groups of muscles, and the abdomen; failure of the appetite; indifference to exertion, perhaps also slight shiverings, and a quasi-febrile state. These indications of disordered innervation may persist from three to seven days, or may be manifested only a few hours before the confirmed malady declares itself. In numerous cases, however, the onset of the disease is sudden. In some cases the patient may be attacked by chilliness, pallor of countenance, coldness of the extremities, low moaning or muttering delirium, quickly succeeded by restlessness flushing of the face, a frequent pulse, a wild expression of the eyes and a hot and dry skin. Occasionally the patient is suddenly attacked with deep coma, or with more or less stupor, attended by a sense of extreme debility. giddiness, dimness of sight, or double vision. Or, finally, the attack may commence with severe pain in the abdomen, immediately succeeded by nausea, and perhaps vomiting. In violent attacks of this character, the extremities become at the same time cold and of a bluish color and the pulse is reduced to a mere thread. After a few hours reaction, more or less complete generally ensues.

Whatever may be the character of the initiatory symptoms they are replaced sooner or later by a violent attack. Cephalalgia and delirium, abdominal neuralgia and vomiting, and myalgia and spasm are the principal morbid factors. They distinguish the malady and the varying prominence with which they occur in different outbreaks gives rise to many diversities in the grouping of symptoms during the course of the disease. The onward course of the disorder is usually rapid. The headache continues often without a lull; vertigo occurs frequently; and after the lapse of a very brief period, measured usually by a few hours, the mind becomes confused, and in some cases a state of restlessness supervenes not unlike that observed in delirium tremens. The mental confusion assumes the form of muttering delirium, with periods of somnolence, often interrupted by cries provoked by the intense cephalalgia, or by the neuralgic pain elsewhere. The delirium is often attended by contraction of the pupils, occasionally by dilatation of one pupil and contraction of the other; sometimes with ptosis of the eyelids, and ecchymosis under the eyes. The delirium ordinarily lasts only a short period, but quickly returns, or the patient falls into a state of apathy or stupor from which he may be partially roused, but into which he relapses when left undisturbed, or there is acute and violent delirium. In the majority of cases there is more or less intolerance of light and sound; in some, to such an extent, that the slightest ray of light, or the least unusual sound is apt to excite convulsive movement
Contemporaneously with or immediately prior to, the mental c

turbances, the painful state of the muscles increases, certain groups being more manifestly affected than others, especially the posterior muscles of the neck, the muscles of the spinal column, and those of the lower extremities. The pain, often of an acutely neuralgic character, shoots along the spine and limbs. and across the walls of the abdomen. Partly as a voluntary action, partly as a consequence of spasm of the painful muscles, the head is drawn backwards. This retraction is one of the commonest and most characteristic symptoms of the disease. The muscles of the neck in particular, become rigidly contracted, drawing back the head upon the vertebral column, and firmly fixing it in that position, so that the patient is unable to move it forwards; neither can this be done by the attendants with the employment of any justifiable degree of force. The countenance at the same time assumes very much the tetanic expression. In some cases the contraction is confined to the sterno-mastoid muscles of one or both sides; in others again it is the extensors that are principally affected, the head being retained permanently in its natural erect position. As the malady advances an actual or apparent tetanoid contraction of other groups of muscles may occur, the trunk most frequently being curved backwards and the legs bent upon the thighs. At the same time there may be fleeting spasmodic action of some of the muscles of the face (trismus). and occasionally of the eyeballs; or in some cases tonic contraction of these muscles, giving rise to the so-called sardonic laugh, or to permanent strabismus. Contraction of the recti muscles of the abdomen is often present. In some cases involuntary twitchings of the muscles are produced whenever the patient attempts to move or seize anything, as if he were under the influence of *strychnia*. In others, violent convulsions are induced, the moment the inferior extremities are raised up, or merely touched. In many cases cutaneous sensibility is much exaggerated, and very frequently a vesicular or roseolar eruption is developed, the former particularly about the lips. The aspect of the patient as the disease advances is dependent upon the degree of pain, the state of delirium or stupor, and extent of spasm which may be present. The countenance is rigid and contracted, the expression of face betokening acute pain; or it is dominated by the delirious fancies; or reflects the mental torpidity; or is distorted by spasm. There is frequently a slight suffusion of the eyes, altogether different from the dusky appearance of typhus; and the face is commonly pale and sunken, seldom and transitorily flushed and swollen, except when affected more or less extensively by the vesicular eruption. The surface sometimes moist, sometimes dry, rarely gives to the hand a sensation of febrile heat, although the temperature of the body ranges above the normal standard. The temperature is increased especially at the beginning, being often as high as 105°F. There is little or no marked disturbance as regards respiration the alimentary canal or the renal function.

As the malady proceeds if it tends towards a fatal termination the spasmodic symptoms increase, the patient becomes comatose, and death may occur either from asphyxia or exhaustion in from ten or twelve hours to seven or eight days. If the disease be prolonged beyond this period, various secondary lesions are apt to occur, especially certain inflammatory states of the eyes and the ears, the mischief in the former organs being shown by ulceration of the cornea, iritis, and sometimes suppuration of the globe; in the latter by less obvious structural changes during life except as indicated by deafness. Or there may be paralysis affecting one-half of the body, or on one side of the face, or one of the limbs, or an isolated group of muscles. Or there may be an inflammatory state, with sero-purulent effusion into one or more of the large joints. Or finally, the patient may fall into a state of marasmus and nervous exhaustion often protracted and not rarely fatal.

In the fulminant form of the malady the onset is often without premonition. The patient suddenly falls into a state of collapse. The surface of the body has often a cyanotic aspect, and is cold and clammy to the touch or covered with profuse perspiration, the face being not rarely shrunken and livid and the eyes deep sunk as in the algide stage of cholera. There may be some shivering at intervals more or less pain of the head and occasional vomiting, sometimes of a grumous, black or coffee-colored fluid. Drowsiness if not present at the outset, rapidly supervenes, followed by or concurrently with delirium. Coma, rarely other than the precursor of death quickly succeeds. In the meantime purpuric spots show themselves over the surface of the body generally, red or purple and circumscribed in the beginning, but rapidly becoming black and often extending their margins so as to form irregular inky blotches, or streaks or great patches; and not unfrequently several of the spots become gangrenous. Sometimes the purpuric spots appear contemporane
with the collapse at the onset of the attack. The respiration
ternaturally slow, and the pulse (if it has not been absent fr

wrist from the beginning) falls with the progress of the disease. The urine is loaded with albumen. Life may be extinguished in less than *five hours*, or it may be prolonged for two or three days. Recovery from this form of the diseass is not unknown, but it is an exceedingly rare event.

In the purpuric form the symptoms which distinguish the simple and fulminant forms of the disease occur combined together in various proportions, some cases approximating more or less closely to the latter, others as is most common to the former variety of the affection. Thus concurrently with shivering intense headache, vomiting rachialgia and retraction of the head, there may be depression of the vital powers approaching collapse, or collapse itself, with the development of petechiæ or purpura, vibices, ecchymoses, hæmorrhage from mucous tracts, delirium, com aand rapid dissolution. In by far the greater number of cases, however, the disease follows the course of simple cerebro-spinal meningitis, but within twenty-four hours or from this period to the fourth day, or still later in the progress of the malady, petechiæ or purpuræ are developed more or less copiously, and occasionally hæmorrhage occurs from the mucous tracts.

Mode of Death.—Death chiefly occurs from (1) asphyxia caused by damage to the respiratory nerve centres; (2) from asthenia; and (3) in some of the fulminant cases probably from necrœmia, so profound are the changes observed in the blood. (Radcliffe, Condie, Steiner).

Diagnosis.—In some instances the disease approximates in certain symptoms to *typhus* or *typhoid*, and it occasionally prevails contemporaneously with both maladies. But the history of the development and progress of the disease, will usually clear up any doubt. There is no symptom or series of symptoms which can be considered as strictly pathognomonic. But when there is acute and fixed pain in the head, rachialgia, aversion to light, injection of the conjunctiva, increased sensibility of the surface, vomiting, acute cries, low muttering delirium or coma, pain and stiffness of the posterior cervical muscles, with permanent retraction of the head, often rigidity of the extensors of the spine, spasmodic tremors or twitchings of the muscles and tetanic convulsions of the limbs, the disease is pretty certain to be cerebro-spinal meningitis.

Treatment.—This disease prompt people treatment. *Gelsemium* is recommended at the beginning of the disease; *Cimicfuga*, *Cicuta*, *Cuprum*, *Lycopodium*, *Opium*, *Stramonium*, *Tabaccum*, *Veratrum* during the disease; *Zincum* where depression prevails; *Arsenicum* and *Baptisia* for tendency to decomposition.

Aconite at the onset of the disease during or after a decided chill, with active inflammatory symptoms. Nervous feverish restlessness.

Æthusa cyn.— Vertigo, a disposition to coma; obstinate vomiting present from the onset; tearing, lancinating, stinging and beating pains all over the head and in occiput; eyes staring, pupils dilated and insensible; face pale and collapsed; *weight in occiput;* tearing, beating, drawing in nape of neck; epileptiform convulsions.

Agaricus.— Great weight in head, especially in forehead and temples with delirium and coma; drawing pains in occiput; painful sensitiveness of the scalp; stiffness of the nape of the neck and back; violent pains all along the spine, with stiffness and soreness; convulsive attacks.

Ammonium.— Second stage, with giddiness, fulness of head, ringing in ears, swelling of parotids, sore throat.

Anacardium.— Sequela of disease, loss of memory, and weakness of special senses.

Apis mel.— Œdematous symptoms about the face; stinging pains all over; great restlessness and tossing which affords no relief. *Crying out* and *screaming* loudly as from stabbing pains; irritable disposition, *great* pain in the occiput; sensation of stiffness in the neck and back; *scanty urine*; great dyspnœa, and sensation as if every respiration would be the last; seldom any thirst; numerous spots or little elevations all over the body, red or purplish; smoky opacity of the cornea and obscuration of sight; constipation; stupefaction and stertorous respiration, with an occasional start as if from a sharp pain; aggravations at night, especially after twelve.

Argentum nitr.— *First stage;* violent headache with vertigo; chilliness, fulness and ringing in ears; digging-cutting pains, from occiput to frontal protuberance, increasing and decreasing frequently; head felt enlarged; epileptiform convulsions.

Arnica.— Aching all over as if bruised; sensation, like a heavy weight, shooting and pressing in both temples; *weakness of cervical muscles*, do not support the head steadily; cervical vertebræ very sensitive to touch and pressure; formication in extremities; excessive diuresis; ecchymosis.

Arsenicum.— Vertigo and great weight in head, with humming in ears; sensation or action as if brain were loose and hurt when moving; scalp sensitive and painful; photophobia or amblyopia; roaring [illegible] spasmodic grinding of teeth; face pale and ashy; tongue dry, trembling; thirst for little water often; anxious breathing; [illegible] stiffness of neck as if bruised, with contortions of the muscles and swelling; great uneasiness and restless anguish; [illegible] spasms; alarming nightly delirium.

[illegible].—Bruised and painful feeling at the base of the brain and upper part of spinal cord; rolling of head from one side to the other; constant [illegible] of the fingers, and constant motion of the feet, unconsciously done by the patient; wandering pains in all the limbs, with [illegible]; feels stiff and sore all over; pit of stomach sensitive to pressure; constipation; paresis of extremities; livid spots all over the body.

Belladonna.—Face very red; stupefying stunning headache from the neck into the head, with heat and pulsations in it; head inclined to bend backward, even before spasmodic retraction occurs, as it relieves the pain; convulsive shaking and bending of the head backward; spasmodic distortion of face and lips; grinding of teeth; inclination to bite; retention of urine, or involuntary micturition; heat of the upper part of the body and coldness of extremities; general hyperæsthesia of all the senses; renewal of the spasm by touch or light.

Bryonia.—Bursting headache; stiffness of neck; great pain in [illegible] and limbs, not allowing motion; wants to keep very quiet; sudden prostration; thirsty for large quantities of water; constipation of small, hard, black balls; worse after noon and after midnight.

[illegible].—Great anguish; lancinations in the occiput, inclining the head to fall backwards; beating of the heart reverberates in the [illegible] [illegible] purplish streaks in the neck, back, or in other parts.

[illegible].—Anguish *at the heart*, and lacerating pains in the nape of the neck; dimness of sight; pulsation and buzzing in ears; faint spells, [illegible].

[illegible].—Constrictive pain at the base of brain, the head bearing to one or the other side; throbbing in cerebellum synchronous with pulsations; deadly paleness; lockjaw; oppression of chest; [illegible] cramps in stomach and limbs; chills severe; cold, clammy [illegible]; pulse small, weak, and slow; *tetanic spasms;* the limbs spasmodically extended, teeth clenched; head inclined sideways or backward.

[illegible].—Second stage, with great restlessness and activity of mind; *amorous frenzy;* priapism violent lancinating pains deep in the brain, especially occiput; eyes dull, sunken; pale, wretched face, with expression of terror, pain and despair; spasmodic constriction of throat; dysuria, or retention and suppression of urine; stiffness, tearing, and lancinating in the nape of neck, extending up into the head; universal tetanic spasm, trembling, fainting; general coldness and collapse.

Cicuta vir.—Vertigo with reeling, moaning and howling; disposition to be frightened; grinding of teeth; diplopia; dilated or contracted pupils; dumbness, deafness; dyspnœa, dysphagia; ashy paleness, or bluish puffed face; cramp in cervical muscles, with inability to move the head after it has been turned in any direction; stiffness of neck not permitting the head to be turned; tension and soreness of the muscles, with retracted head; tonic spasms of cervical muscles; trembling of limbs; convulsions with cries; pressing together of the jaw; numbness and distortion of the limbs; opisthotonos; violent sudden jerks through the head, arms, and legs, after fits insensibility and immobility; *gastralgia with vomiting;* painful distension of abdomen, and spasm of pectoral muscles.

Cimicifuga.—Pain in every part of the head, especially in vertex and occiput, extending to shoulders and down the spine, with delirium similar to mania a potu; eyes dull and sensitive to pressure, with visions; conjunctiva red, with lachrymation; pupils dilated; foul breath, swollen tongue, fuligo, dryness of throat, with constant desire to swallow; general malaise, with nausea and vomiting; urine pale and copious; colicky pains, muscular twitchings, frequently changing location; profuse cold sweat all over the body, with very quick pulse.

Cocculus.—Violent headache, with persistent vomiting, vertigo, and semi-consciousness; headache as if the eyes would be torn out; and violent pains in the forehead; *convulsive trembling of the head*: face pale and sallow, but puffy and bloated; spasmodic oppression of chest, respiration heavy and laborious; painful stiffness of the cervical muscles; he has to lean his head against something; miliary eruptions fainting fits; epileptiform and hysterical convulsions paralysis.

Crotalus.—Pain in all extremities; terrible headache, pain as from a blow in the occiput; paleness of face as in faintness; painfulr in pit of stomach; dyspnœa, with anxiety, thirst, nausea, diarrh heart beat feeble; painful paralytic sensation in extremities.

Cuprum acet.— Affects specifically the spinal cord; congestion of brain, with convulsive motions of extremities; can not hold the head up; eyes dim, lustreless, sunken, with blue rings around; sad depressed features; dry mouth, great thirst for cooling drinks; nausea, vomiting, and torpid stool; nervous trembling with very great acuteness and sensitiveness of the senses; clonic spasms, beginning at the periphery; sleep or coma; paralysis of all the muscles of the back up to the neck.

Digitalis.— Heart's action irregular and labored; delirium like mania a potu; great pressure and weight in head; violent lancinating pains, especially in vertex and occiput; when sitting or walking the head falls backwards, as if the *anterior cervical muscles were paralyzed;* convulsive efforts to vomit; vomiting with coldness, prostration, and fainting; stiffness in the nape and side of the neck; tearing, sharp stitches, aching and cutting pains in nape of neck; convulsions with retraction of the head, syncope, and collapse of vital powers.

Gelsemium.— At the very onset of the disease, severe chill followed by congestion of the brain and spinal cord, livid cheeks, dilated pupils, little or no thirst. Perfect loss of strength and great exhaustion, staggering gait, dulness of speech, icy coldness of hands and feet, pulse very weak or hardly perceptible; laborious and weak respiration, nausea, vomiting; eyelids close involuntarily in spite of all he can do; itching of head, face, and neck; *sweating relieves.* Mental faculties retain their activity though their power over the muscles is lessened or impaired; he can not direct the movements of the limbs with precision; coma.

Glonoine.— Violent congestion of head, with sense of expansion; pains ascend from chest and occiput; blindness, with faintness and nausea, pale face, pain in the whole length of spine; congestion of chest, with labored action of heart.

Hydrocyanic acid.— Sudden and desperate cases; insensibility with protuded half open eyes; dilated immovable pupils, with blindness; roaring and deafness in ears; distorted bloated, and bluish face; tongue paralyzed and protruded; loss of speech; retention of, or involuntary urine and stool; rattling slow respiration; irregular, feeble pulse and beating of heart; general coldness, with sweat in head.

Hyoscyamus.— Heaviness of head and violent pains alternating with pains in nape of neck; constricting stupefying headache; undulating sensation in brain, as if from throbbing in the arteries; pressure in vertex and drawing in nape of neck, when turning the head; sensation as if the brain were shaken and loose; dimness of eyes; fearful grinding of teeth, *lockjaw;* palsy of tongue, vomiting; involuntary stool and urine, or retention; spasms of chest, with arrest of breathing; stiffness of cervical muscles, with tension as if too short, on bending neck; twisting of neck to one side; stiffness of arms and legs, jerking of hands and feet; epileptiform spasms, hyperæsthesia of skin; brown spots, large pustules; gangrenous vesicles on body; pulse small, intermitting quick.

Ignatia.—Hysterical complications or rapid alternation of symptoms.

Lycopodium.—Dread of solitude; active, irritable, and melancholy mind; stupefying *headache, extending down the neck*, with great weakness; acute hearing, with roaring in ears; acute smell; tongue swollen; bloating of abdomen, with tension as of a hoop; same in chest; much flatus; urine loaded with lithates; burning pains between shoulders; numbness and twitching through body and limbs.

Nux vomica.—*Shocks*, starting suddenly from one portion of brain, with numbness and paralytic drawing in the limbs; sensation, as from a bruise in back part of head; scalp sensitive to touch; strong reverbations of sounds in ears; oversensitive to odors; neck stiff, with heaviness; stitches through the body in jerks, feels sore all over; *opisthotonos with consciousness;* convulsions renewed by the least touch; fear of sleep; frightful dreams; irritable humor and hypochondriasis.

Opium.—Stupefaction, with or without pain, delirium, mania, heaviness with great congestion to head, *occiput feels as heavy as lead*, the head falling back constantly; eyes fixed and half-closed pupils contracted or dilated, insensible to light, staring and glassy look; face bloated, muscles relaxed, with twitching of lips and flapping of cheeks; lockjaw; strangulation; intense thirst; vomiting with colic and convulsions; abdomen hard and bloated; constipation and diarrhœa, urine scanty; snoring, rattling, slow respiration; suffocative attacks; dyspnœa, opisthotonos followed finally by painless paralysis; spasmodic jerkings and numbness of limbs, pulse variable; heat with sweat, sleep with sweat, *worse while perspiring* (*Gels. better*).

Phosphorus.—*Extensive petechiæ or hæmorrhages at an early stage;* congestion to head; burning-stinging pains and pulsations commencing in occiput; contracted pupils; difficult hearing; *pneumonic* *complications;* dyspnœa, with inability to exert himself; back pains as if broken formication and tearing in limbs; frequent fainting.

Plumbum.—Paralytic symptoms at an early stage; heaviness of head, especially in cerebellum; the palsied parts soon fall away in flesh, the limbs become painfully contracted; frequent spells of colic, with retraction of abdomen; somnolency.

Rhus tox.—Anxiety, restlessness, stupefaction; vertigo, fulness and bruised pain in head extending to ears; bleeding of ears and nose; dry cough with perhaps bloody sputa; pain in back, as if sprained; tearing tensive pains, with stiffness of muscles and joints; vivid dreams; various eruptions.

Solanum.—Delirious raving, rage, imbecility; horrible headache, as if the head would split; heavy staggering, uncertain gait, slow pulse, contracted pupils, and weakness in lower limbs; bruised feeling in back and limbs; neck feels stiff and sore, as if bruised; stiffness and convulsions, excited by the least touch; tetanic rigidity of whole body; tremor violent subsultus tendinum; convulsions, with moaning and coma.

Pulsatilla.—Mild, gentle disposition; inclined to weep; very restless; no thirst; wishes to have the doors and windows open; pain in the back on swallowing; stiffness in back of neck; much pain in turning the head to either side; sleeplessness with great desire to sleep; almost constant crying out or moaning; cough, with pain in the back; pain in the back at every motion.

Stramonium.—The patient is either in a supplicative mood, pleading for help, or is very irritable, with raving and disposition to strike, bite, or injure others; staring eyes; shrinking look as if from fear; raising of the head from the pillow and falling back again; desire for light and company; loss of voluntary motion, stiffness of the whole body; or there may be violent motion of the limbs.

Sulphur.—When patients are very liable to relapse.

Tarantula.—Severe headache, aggravated by touch, with sensation as if cold water *was poured upon the head*, with great noise internally; deep intense headache with restlessness, anguish, and malaise, the pain flies to forehead and occiput, with photophobia; pain in occiput as if striking it with a hammer, extending to temples; burning, scorching heat in occiput, extending all over posterior part of head; great pricking and itching over whole body; convulsive trembling of body; convulsions, paralysis, complete retention of urine and fæces.

Tartar emet.—Great drowsiness, stupefying headache, nausea, cold sweat, blindness, convulsive twitchings, pain with sweat, cough with suffocative attacks, pulse full, hard, quick, and trembling.

Veratrum album.—Violent headache, with delirium or unconsciousness; copious vomiting, pale, cold, and cadaverous face; stiffness of neck, choking in throat, feeling as if head would burst; rolling head violently from side to side, with short screams, bores head in pillow; *convulsive shocks and vomiting as soon as head is raised;* clonic and tonic spasms, with loss of sense and motion; cramps in limbs; tingling and coldness in limbs; choleraic collapse simultaneously with intense congestion.

Veratrum viride.—Vertigo and headache, with loss of sight, dilated pupils, and vomiting, trismus, opisthotonos, constant severe pain in neck and shoulders, so that he can not keep his head erect; distortion of muscles, especially of face, neck, fingers, and toes; convulsive twitchings as from electric shocks; sudden spasms with nausea, vomiting, and general prostration, the least quantity of food produces vomiting; trembling as if the child was frightened, and on the verge of spasms. The pains begin in forehead, and run back to occiput and spine.

Zincum.—Convalescence retarded; *weak memory*, with stinging pains in head; blindness, itching, biting, watery eyes, soreness and constriction in throat, ravenous hunger, flatulent colic, constipation, dysuria, priapism, amorous frenzy (*Canth.* in first stage), spasms and pain in chest, numbness, trembling, twitching in hands and feet, flushes of heat in head and face; coldness of body; profuse and easy sweat; exhaustion of nerve force.

CHRONIC HYDROCEPHALUS—CONGENITAL AND ACQUIRED.

This disease is a real dropsy occurring within the cranial cavity. The fluid may be collected in the sac of the arachnoid or in the ventricles of the brain beneath the arachnoid membrane. The affection may be congenital or acquired. When it is congenital it is often, though not invariably associated with malformation of the brain. In subsequent childhood, and excess of blood in the brain, or its deficiency, or the existence of some impediment to the circulation through the organ, are conditions all of which have been found to give rise to the effusion of fluid into the cavities of the brain or upon its surface. Instances of chronic hydrocephalus are on record which have succeeded to hæmorrhage into the sac of the arachnoid; others again that have been connected with wasting of the brain; in consequence of the supply of blood being inadequate to its due nutrition, or in which the obliteration of the sinuses by disease or the pressure of a morbid growth upon some of the vessels of the brain has interfered with the due performance of the cerebral affection. The disease is regarded according to Rokitansky and Vrolik, as a slow kind of inflammation of the arachnoid, especially of that lining the ventricles which may exist during fœtal life, or may not have attacked the child until after its birth. According to the situation in which the fluid collects, a division has been made of chronic hydrocephalus into the *external* and *internal*, the former term being applied to cases in which the fluid collects in the sac of the arachnoid; the latter to those in which the fluid collects in the ventricles of the brain. The two sometimes coexist, but generally they are independent of each other; the internal hydrocephalus being the more frequent and the more important. (West.) Acquired hydrocephalus may be brought about by malnutrition sending up an extra amount of blood to the brain. So great is the venous stasis that the serum exudes, giving rise to acquired hydrocepalus which usually begins to show itself about the period of the first dentition, but is usually due to digestive disorder.

Pathological Anatomy.—The most extensive effusion into the ventricles takes place in the fœtus, and the delivery often becomes impossible till perforation has been resorted to. In congenital dropsy of the head, the quantity of the water may increase from a few ounces to several pounds; according to some authors even to ten pounds. The ventricles are distended into large sacs, and their upper walls so attenuated that they rarely measure a line in thickness, or they may be reduced to so thin a covering, that it is impossible to dissect it off. The convolutions of the cerebrum are faintly marked on the upper surface of the brain may be perfectly smooth, and the meninges extremely attenuated. The deformity ot the cranial bones, naturally is very much retarded, the sutures become wide enough to admit a finger and the anterior fontanelle attains a diameter of several inches. Should life last for several years, an ossification finaliy takes place: this is affected by the bones sending out from their borders, long, radiating projections toward each other, till they become united, and thus form excavated shallow sutures between them; or, finally, they may be united by a number of ossa triqueta becoming developed in the fontanelles, and between the separated bones. As these forms of union never proceed uniformly, one suture becoming closed on one side earlier than upon the other, marked malformations of the skull result. (Vogel.) A very marked disproportion is visible between the enormously increased cranium and the small face, in some extreme cases the former measuring from twenty-four to twenty-eight inches. Congenital hydrocephalus may also exist with a very slight increase in size of the skull, or even with an abnormal smallness of it (microcephalism.) In external hydrocephalus the pressure exerts itself from above downwards, and the brain undergoes various alterations; the fossæ of the skull are more or less excavated, and in extreme cases, form one common deep cavity, from which the roofs of the orbits are more or less indented. (Steiner.)

Acquired hydrocephalus may occur either in the external or internal form, or as œdema of the pia mater, or of the brain. The changes are those found in the congenital affection with this difference, that it does not reach the same extreme extent, especially when it is developed in a skull already closed or nearly so, and the tissues of the brain are thickened, firm and occasionally scattered with connective tissue granulations.

Œdema of the brain is characterized either as a mere moistening through of the brain mass, or as an abundant collection of serum in it. In the first place the cut surfaces are strongly, glistening, in the latter the fluid exudes in the form of drops. The brain is either very markedly anæmic and more or less softened, or bears signs of hyperæmia. Cerebral œdema is frequently combined with œdema of the pia mater and dropsy of the brain cavities.

Symptomatology.—In whatever way the disease begins, impairment of the process of nutrition is sure to be one among its earliest symptoms, although Rilliet and Barthez assert that "nutritive functions are as a rule well performed in hydrocephalic children, unless they be in an advanced stage of tubercular cachexia, or chronic intestinal catarrh. Except such cases the children are plump and well nourished and even sometimes have an abundance of fat, which is certainly morbid." The cases, however, in which nutrition is unaffected form the exception, not the rule. The child sucks well, voraciously even, and yet does not grow; he may even waste. His bowels are generally constipated, and his motions are unhealthy.

The gradually increasing head soon attracts notice and the peculiar aspect and physiognomy of a hydrocephalic child soon develop themselves. The fontanelles enlarge and the anterior one is seen o pulsate and grow tense and prominent; and at such times t heat of the head, and the child is more restless than usual. The sutures of the head widen and the head by degrees assumes a globular shape. The forehead is round and prominent, the orbital plates of the frontal bone gradually become slanting, and the eyeballs become half hidden under the lower eyelid, so that the cornea cannot be seen until this is depressed. The parietal bones being pushed outwards, and their edges being last to ossify there is a considerable increase of the saggital suture, while the occiput is driven downward and backward. From the same cause, augmented pressure within the skull, a strong collateral circulation occasionally also forms in the scalp and frontal integument, the distended vessels appearing like tortuous blue cords. The hair grows very scantily on the head; the face is small and contrasts remarkably with the large size of the head, and looks triangular, with the apex of the triangle at the chin. The child's expression is dull and stupid, and he has a very aged look; he cannot sit or hold up his head, but lies down constantly. As the fluid continues to accumulate and the disease progresses, the sight becomes impaired, and is completely lost after a time; the eyes are bright and shining, but restless and oscillating. Hearing is as a rule preserved much longer, but is lost at the close of the disease. Paralysis often set in; contractions and rigidity of the limbs and trunk are not very rare, according to Rilliet and Barthez, particularly in very young children.

Attacks of laryngismus stridulus occurs quite frequently from the pressure of the fluid upon the cord, and they may even come on before there is much enlargement of the head. (Ramskill.) The mental capabilities sometimes remain unaffected for a remarkably long time, and it is sad to behold the little sufferer, who with a monstrous head, suffering involuntary fæcal and urinary evacuations, with limbs paralyzed or contracted, yet answers all questions rationally, and even reasons acutely. In some cases, however, mental aberration is among the early symptoms, ending in imbecility. The sensibility of the skin is diminished or abolished, especially in the paralyzed extremities. Hemiplegia occurs less frequently than bilateral paralysis, the lower extremities being the most frequently affected. This is followed by an insensibility, then a paralysis of the sphincters of the bladder and rectum. Bed sores are unavoidable. If no other disease such as tuberculosis or intestinal catarrh supervene, the nutrition will not be impaired; the appetite often becomes of a voracious character. In some cases convulsions occur very frequently being induced by very slight causes. Almost every case, however, of chronic hydrocephalus has pauses in its course, during which the child seems to enjoy a comparative immunity from suffering, and gains flesh, while its head ceases for a time to enlarge. Nothing can be more variable than the frequency of these pauses, or their duration, and the course of the malady, as may have been already inferred from the preceding history, is of a chronic nature. (Vogel.)

Diagnosis.—Extreme cases of chronic hydrocephalus, especially when congenital, offer no diagnostic difficulties, but less well marked cases may be confused with encephalocele and perforating fungus of the dura mater, abnormal thickening of the bones of the skull which sometimes obtains in rickets, and hypertrophy of the brain. In encephalocele the feel of the swelling is doughy and elastic not fluctuating; it is local not general, and it is not transparent. In cases of fungus of the dura mater which has perforated the cranium at birth, the general size of the head is not affected, the perforated spot can easily be detected, and it is over the central parts, not near the sutures and fontanelles, it feels doughy, elastic and quasi-erectile. Acquired hydrocephalus has also to be distinguished from a merely excessive development of the head apart from disease. The absence of all cerebral symptoms is sufficient in such cases to establish the diagnosis. Sometimes hydrocephalus may be suspected where none exists, because of the disproportion between a small, emaciated, triangular face and largely developed skull.

From cases of abnormal thickening of the bones of the skull the diagnosis may be made by a careful examination of the bones of the head. In rickets the development of the skull is not uniform; it seems as if flat bumps had been super-added to the centre of the frontal and parietal bones and the finger can detect the exact spot where the bones of the limbs begins to thicken. Swelling of the articular ends of the bones which is characteristic of rickets, will also awaken suspicion. Rickets and chronic hydrocephalus may coexist. Hypertrophy of the brain is an exceedingly rare affection. (Ramskill.)

Prognosis.—The termination of this complaint is generally in death, which occurs from some intercurrent affection, or from convulsions due to passive congestion of the meninges, or from an attac
laryngismus stridulus, or lastly from gradual exhaustion from
tive asthenia. The disease extends one or two years, or even lo

In some instances, it has been said that a real cure takes place, and that the fluid is absorbed. Such cases, however, must be quite exceptional, the rule is that the fluid is unabsorbed, and the most that can be hoped for, is the arrest of its progress. Usually when convulsions appear they close the scene.

Treatment.—The chief remedies indicated for the general as well as the cephalic condition, are: *Arsenicum*, *Calcarea phos.*, *Helleborus*, *Silicea*, *Sulphur*, *Zinc*. If the child can be put upon *Calc. phos.* 2 and *Argentum* 6 early, as suggested by Grauvogl, § 338, we may avert serious consequences. The food should receive special attention. It should be easy of assimulation, and should not be loaded with lactic acid, (*i. e.*, an excessive amount of sweet) nor with fats and serum like diluted cream. The muscular and bony systems should be especially nourished. Compare other forms; also Dentition, Indigestion, etc.

HYDROCEPHALOID.

This name has been applied to that condition which is induced when the brain does not receive its usual supply of blood. The symptoms often present a striking similarity to those met with in inflammation of the brain; a fact implied in the name hydrocephal*oid*.

Anatomical Appearances.—The brain is found softened and watery, the gray substance pale and not sharply defined, but passes gradually into the white portion. The meninges are infiltrated with serum, and in the ventricles only the normal amount of fluid is found. It is also probable that the quantity of fat in the brain has become decidedly diminished.

Symptoms.--After various exhausting diseases, generally such as diarrhœa, from gastro-enteritis, entero-colitis, etc., children under one or two years of age are seized with a class of cerebral symptoms, which at first sight, without due reflexion, might certainly give rise to the thought of an exudation in the brain. The most striking of these is an incessant rubbing to and fro of the head, or a boring of it in the pillow, by which the occiput is wholly deprived of hair, and small abrasions of the scalp, loss of epidermis, and farunculosis often result. Many children often pluck the head with their hands, pull the hair and ears, and scratch their faces until they bleed, and cease to notice the objects by which they are surrounded. The eyelids are half closed, and in the majority of cases, the globe is rolled upward. The upper extremities are in a state of rigid flexion. The thumbs are drawn into the palms, and the fists closed so firmly that considerable strength is requisite to open them, and the palms of the hands become denuded of the epidermis. On examining the heads of children who in consequence of profuse diarrhœa have become atrophic, and in whom these cerebral symptoms have appeared, the temperature will be found to be elevated, the anterior fontanelle depressed, the cranial bones overlapping each other; in short, all the signs of such an extremely aggravated state of cerebral atrophy, that we are enabled usually to prognosticate a fatal termination. (Vogel.) Unless properly managed.

Diagnosis.—Bear in mind the distinctive characters of this spurious hydrocephalus, the pale, cool cheek; the half shut, regardless eye; the insensible pupil; the interrupted sighing respiration; and when the symptoms are more ambiguous, the judgement should be relied on concerning the nature of the case, aided by tracing the manner in which they came on, and the causes to which they seem attributable. In very young children, in respect of whom the question is most likely to arise, it may be necessary to distinguish between congestion and exhaustion, between fullness and emptiness, between too much and too little pressure. This may be accompanied by taking notice of the state of the unclosed fontanelle. If the symptoms proceed from hyperæmia or inflammation, or an approach to inflammation the surface of the fontanelle will be found convex and prominent; while on the other hand if the symptoms originate in emptiness and want of support the surface of the fontanelle will be concave and depressed. (Watson.)

Prognosis.—In this disease it can only be predicted with an accuracy in proportion with the possibility of the removal of its causes. Generally it is more grave, the younger the child, but even in the worst cases it is not hopeless, for the infantile system, when judiciously treated, often shows a strong reactional activity.

Treatment.—The chief remedies are: *Apis. Arg. nitr., Ars., Æthusa, Carbo veg., China, Kali brom., Kali carb., Ig., Lyc., Merc., Nux v., Phos., Phos. ac., Puls., Sepia, Sil., Verat. alb.*

Æthusa cyn.—Disease supervenes upon long continued chronic gastritis. Milk disagrees, and the child vomits soon after nursing; great irritability, or the patient lies stretched out in a semi-comatose condition; pupils dilated and insensible to light; features expres great anguish; pulse very feeble; mouth very dry or very moist; great weakness, child cannot hold up its head.

Apis.—Hydrocephaloid after exhausting diarrhœa or summer complaint, Heat in the head, all other parts of the body cold; ghastly paleness; sickness of stomach and vomiting when the child is raised up; great emaciation and prostration; pulse filiform, while the heart beats violently against the chest, faint flushes upon one or the other cheek; absence of thirst, with dry tongue, and dry hot skin; apathy slight reaction to light and sound.

Arsenicum.—After exhausting diarrhœa, or in consequence of morbus Brightii; deep sopor or coma vigil, with staring, spasmodically — moving eyes, dilatation of pupils, difficulty of hearing, speaking or swallowing; dryness of tongue, sooty nostrils; abdomen sunken; stiff neck, involuntary stool and urine; palsy of extremities.

Camphora.—Great coldness of the skin, and yet the child cannot bear to be covered; throbbing pain in the cerebellum; features distorted, eyes sunken; face, head and feet, icy cold; great anguish; half stupid and senseless; cramps; touching the stomach causes him to cry out; great faintness and prostration.

Ignatia.—Sudden metastasis from the bowels to the brain in children affected with cholera infantum, during dentition; sudden paleness of face — with rolling, tossing motion of the head; difficulty of swallowing; delirium, with convulsive motion of the eyes and lips.

Kali bromide.—Anæmia of brain from loss of fluids; constant drowsiness; coma; pupils dilated, eyes sunken, eye-balls moving in every direction without taking any notice; feet and hands blue and cold; pulse imperceptible.

Mercurius.—Heaviness of head, vertigo when raising the head, with nausea and vomiting, the child wants to lie quietly in a horizontal position; somnolence, indifference, with a mournful expression of face; diminution of all intellectual faculties; amblyopia; weakness and paralysis of extremities; convulsions.

Veratrum album.—Sinking in of fontanelles, vision obscure, pulse filiform, complete extinction of vital power; cold collapsed face, nausea and vomiting from least motion; tongue cold, and unquenchable thirst. (See Diseases of the Bowels.)

The food should be nourishing and stimulating, and at the same time easily assimilated. One of the infantile foods may be needed. (See p. 333.)

ENCEPHALOCELE AND HYDROCEPHALOCELE.

Simple encephalocele or cerebral hernia consists of a tumor formed by the passage of a portion of cerebrum or cerebellum through an aperture of the skull; when together with this protrusion there exists a greater or less collection of serum it is termed a hydroencephalocele. It is usually congenital, though an encephalocele may be the result of a wound or necrosis of the bones of the skull. The congenital hernia most usually occurs in the hollow of the occipital bone, or the nasal part of the frontal bone, though it may also be met with in the smaller sutures. In size it varies from that of a pea to that of a child's head, according to the position of the prolapse and the quantity of serum present. In shape the hernia may be pointed or flattened. The tumor is covered with healthy skin, though it is often thinned and devoid of hair, usually pulsates, and is sensibly influenced by strong respiration, especially by cries and coughs, and it may be more or less reduced by pressure, though this must be attempted with the greatest care, as manipulation may readily induce serious symptoms, as vomiting, convulsions, unconsciousness, tetanic contractions, or paralysis. The narrower the bony chasm, the more pediculated the tumor; and the wider it is, the more flattened the prolapsed part will be. When it makes its exit at the root of the nose, the nasal bones will be found forced asunder, and the distance between the eyes increased.

Treatment.—If the tumor can be reduced without inconvenience to the child, it should be replaced in the skull and retained there by means of a leaden plate, or one of stiff leather, kept in place by a bandage. The use of the ligature, either alone or followed by excision is unsafe, as children treated in this manner have died of meningitis in consequence. The following method has sometimes proved successful: A puncture is made in the coat of the tumor with a sewing needle, and this is sufficient to allow the serum to escape. If the liquid is reproduced it may be let out again at the end of some days, and the operation repeated seven or eight times if necessary. By seconding this with methodical compression, the rupture of the sac is prevented, and the increase of the cerebral hernia also; the skin becomes strong, and the child is placed in the most favorable circumstances for recovery, or at least for the preservation of existen (Bouchut.) *Calc. phos.* is a remedy that may afford relief, also *Ar* *tum*, *Calc* *Sil.*, and *Apis* may be indicated.

SCLEROSIS OF THE BRAIN.

Induration of the brain is extremely rare. Rilliet and Barthez, and Weber, have reported single instances only. The sclerosis of children like that of adults either involves the whole brain, or only small portions; the degree of induration fluctuates between an almost.imperceptible hardness, and a cartilaginous consistence. In the latter case it is always combined with atrophy, loss of substance, and textural alteration. It is sometimes met with in fatal cases of scarlatina and typhoid fever. In somewhat extensive meningeal hæmorrhage, purulent meningitis, the adjacent parts of the brain usually participate, and the sclerosis then forms the finale of these processes. There is an almost cartilaginous hardness, the indurated portions presenting a dirty grayish-yellow color, which to a great extent takes the place of the gray substance, though the white substance also becomes more or less affected. Carcinoma of the brain should not be confounded with this induration. Cerebral sclerosis possesses little else than anatomopathological interest, for the symptoms produced by it are not characteristic, and therefore not possible of diagnosis. (Vogel.)

TUMORS OF THE BRAIN AND ITS MEMBRANES.

Among the tumors which appear in the infantile brain tubercle is the most frequently observed; only exceptionally are carcinoma, sarcoma, glyoma, syphiloma, and parasitic tumors met with.

Symptoms.—It would be impossible to describe any complex symptoms which would include all tumors, for an account of their slow and gradual development, their difference in size, number and seat, and the varieties of their relations to the surrounding structures, it is quite evident that each case will have its own peculiarities. Numerous cases have shown that tumors of large size may grow and be in existence for years, even till near their fatal issue, without giving rise to any suffering that might indicate their presence. Still out of the great number of varying and often contradictory symptoms the following may be selected as likely to be of use in the diagnosis of cerebral tumors. Unilateral convulsions, paralysis and muscular contractions which occur periodically or are persistent in the same nerve trunks, indicate with great probability, in children, the existence of some centre of diseases in the hemisphere opposite to that of the affected side.

Epileptiform convulsions occurring at first with long intervals, but afterwards more frequently, and always in the same group of muscles on the same side, or, if bilateral, always with the same characters, may give rise to the suspicion of a cerebral tumor. Tumors at the base of the brain generally give early indications of pressure, as interference with and weakening of sight, amaurosis, strabismus, ptosis of one or both upper eyelids, vomiting, pain in the head, epileptiform convulsions, and paralysis of single or several muscle groups. In tumors of the pons continuous or intermittent pain referred to the occiput and passing down the neck; unsteady gait, disturbance of the power of co-ordinating movements, stumbling, trembling, or chronic quivering of the muscles, disappearing when the patient is lying quiet, but becoming very pronounced when he attempts to walk.

Treatment.—The treatment does not promise much. If we can relieve the symptoms we may render the life of the child more comfortable. The same remedies would be needed here as in tumors of the same kind elsewhere, *i. e.*, *Arsenicum*, *Calc.*, *Calc. phos.*, *Merc.*, *Nitric acid*, etc.

CONVULSIONS—SPASMS—FITS.

It can not be kept too much in mind that convulsion is a symptom and not a disease. But it is the most striking one of the symptoms in which it occurs, and in many cases the only one about which we have definite knowledge.

Etiology.—Convulsions occur in association with organic changes in the nervous system of the most varied kinds. They follow injuries to the head either immediately or remotely; they are often associated with rickets; they may be the result of disturbances of parts of the body at a distance from the central nervous system, the result of eccentric irritations, such as the irritation occurring with dentition, or the irritation of worms. There are also a large number of convulsive seizures which (for want even of that approximate knowledge we have of such causes as those just mentioned) we are obliged to speak of as essential, eclamptic, epileptic or epileptiform. The symptom occurs at all ages and in many diseases; there are many varieties in part of the body affected by spasm—it is unilateral or general—many degrees in severity—there may be local spasm without loss of consciousness, or general convulsion with profound coma

--and in times of recurrence—there may be one attack a week, or fifty in a day.

It is the phenomenon of an occasional discharge of nerve tissue (no doubt of gray matter), and points not to destroying lesions, but to unstable nerve tissue—to "functional" changes. But the most careful study of the paroxysm tells us nothing of the *pathological* process by which such changes are brought about; does not, for instance, enable us to say whether these changes are the result of "irritation," of tumors, of uræmia, or whether they are not minute changes (epileptic) to the pathology of which we have no clue. Convulsion is *par excellence* the nervous symptom of fleshy infants and young children, but the tendency decreases with increasing years.

West says that in a large proportion of cases of convulsion in the infant, convulsions answer to delirium in the adult; and Trousseau remarks that there are children who have convulsions as easily as some have delirium or even dreams. This lies in the rapid development of the nervous system and in its state of active change and the large current of blood sent to the brain. Its nutrition will be in considerable excess of its expenditure, whilst in adults the two will be more evenly balanced. For this reason the child's nervous tissue will naturally be more unstable than that of the adult. It will more easily discharge from a slight cause, or to use a more common expression, it is more excitable. It is scarcely fair to use the word "cause" with regard to convulsions, but we can, however, group cases according to certain circumstances, and the following list will show better than any exposition can, the limited way in which the word "cause" is to be used with reference to convulsion. When called to a case of convulsion, we may find: (1). That an acute illness is setting in, as for instance, an exanthem or acute cerebral disorder. (2). That the convulsion is one of a series of symptoms, the result of organic disdisease of the brain or of its membranes, such as tumor, abscess, syphilis, tubercle, etc. (3). That the fit is part of some chronic condition of ill-health, such as rickets, exhaustion and emaciation with diarrhœa. (4). That the child is suffering from some slight and temporary thing, such as an overloaded stomach, perhaps diarrhœa, the irritation of worms, or the irritation of teeth. (5). That the fits are of a kind which for want of better knowledge, we are obliged to call essential eclamptic, or epileptic.

The Paroxysm.—Convulsions occur in all degrees and may be a twitching or clenching of the hands only, or an occasional grim smile in sleep, or the spasm may be general and so severe that the child dies of the paroxysm, even of the first. Attacks of slight occasional spasm, be it of one finger, have the same *general* significance as a severe convulsion has; they are both convulsions. Each of them is a sign that there is an abnormal discharge of the nervous system or some part of it. The slighter spasms are often the premonitory symptoms of severer convulsions, and should excite anxiety lest when the child be afterwards exposed to such causes as fright, exhausting diarrhœa, etc., very severe convulsions follow.

The child may be suddenly attacked by a convulsion in the midst of what appears to be perfect health, but most authors admit that there are usually warning symptoms. Children are peevish and sleepy, sleep with their eyes partly open, twitch about the mouth, start in their sleep, grind their teeth and may have night terrors. There may be twitching on *one* side of the face or in both limbs of *one* side. When slight symptoms appear during waking, especially if now and then a vacant look points to some loss of consciousness, however transient it may be there is reason to fear that severe convulsions are at hand. (Jackson). Churchill says: "I have frequently observed a sort of gradation from simple irritation and restlessness, to starting, surprise, wildness of look, partial or local convulsive movements, and, lastly, general convulsions." When the attack takes place the child appears surprised as by a strange impression, its look becomes fixed, and appears as if lightened up; its body lengthens; the limbs stretch and stiffen; the head is thrown back; the face is swollen and is covered by a sudden blush; then after an instant of uncertainty and anguish, the head is observed to turn to the left or right, the jaws tighten, and the limbs strongly stretched out, are suddenly agitated by alternate efforts of flexion, and extension, and the respiration appears as if suspended. Soon an internal effort seems to be produced, the face becomes blue, the superficial veins of the neck prominent and well defined beneath the skin, and then the convulsive movements. The eyes are agitated independently of each other, and then are hid under the upper eyelid, so that only the white surface of the sclerotic is perceived. The features are deformed in consequence of the rapid contractions of the muscles of the face, and the lips and angles of the mouth are contracted into the risus sardonicus. The hands are turned inwards, the arms are convulsed, flexion predominates and takes place by jerks, which carry the hand upon the chest, and cease all at once, when it returns to its original position. The toes are separated and bent towards the sole of the foot, the knees are drawn up, and then the limb is again lengthened. Respiration is irregular, the movements of dilatation of the thorax are rapid, short, incomplete, sometimes intermittent. A long stoppage of respiration is the worst symptom that can take place, and when a child dies in a fit, it is no doubt due to the prolonged fixation of the thorax. The older the child, the more the limbs, and the less the chest suffer. The muscles of the bladder and rectum are no longer under the dominion of the will, and the contents of these organs are voided without the child being able to retain them. When the convulsive attack is about to disappear, a general movement of relaxation is observed; the face becomes pallid, the eyelids droop; the muscular movements become calmed, and are only observed at most distant intervals; the stiffness of the limbs disappears, respiration resumes its normal course, and the child falls asleep. (Bouchut). Such an attack lasts for only a few seconds, or at the most minutes; paroxysms that last longer than this are due to serious organic lesions of the brain. The child may have a second fit before he has recovered from the effects of the first, or as the nurse will say, "in and out-of fits all day long."

Unilateral Convulsions and Hemiplegia.—The convulsions are limited to one side, or they affect one side first and chiefly. In such a fit, if it be severe, the face, arm, and leg of one side are in a spasm; the head and both eyes turn to the same side, and next the chest becomes fixed. When severer still, the other side of the body becomes affected in the same way as the first, but to a less extent. The spasm may be for awhile very limited, *e. g.*, a few jerks of the head to one side, or to spasm of one side, or it may be sometimes limited, and may at other times affect the whole of one side, or spread over the whole body. When the spasm is very limited, to the arm for instance, or even when slight in degree, to one side of the body there may be no loss of consciousness. It is important to note this kind of convulsion because it is the one which is often followed by hemiplegia. We should always carefully examine the child's limbs, after, as well as during a fit, and when this kind is frequent we may find the arm and leg paralyzed. The paralysis usually passes off, but if it remains for many days after the convulsions have ceased, it is very likely to be permanent. The palsy may be only a little weakness or there may be complete immobility. In most cases the leg at all events recovers so far that the child can walk. As the child grows up, there is often a mixture of palsy and spasm. There is either "contracture" or "spastic rigidity" of the hand and foot, the latter suffering less than the arm. The paralyzed parts are smaller than those of the other side, the bones as well as the soft parts, and this is particularly the case with the scapula. (Jackson).

Treatment.—*Belladonna* 12 was a favorite remedy of the late Dr' G. D. Beebe for convulsions. *Tart. emet.* 1 is sometimes resorted to with prompt relief of the spasm. For the spasm or its attendant phenomenon, one of the following remedies may be needed: *Aconite, Ambra, Apis, Ars., Bell., Caust., Cham., Cina, Cuprum, Coff., Gels., Ign., Ipecac, Kali brom., Lach., Lachn., Lil. tigr., Merc., Nux v., Opium, Scutel., Stannum, Sulph., Verat. alb., Zizia.*

Aconite.—Great febrile excitement; hot dry skin; anxiety, anguish; convulsions from teething; starting; twitching of single muscles; child gnaws its fist, frets, cries; costive, or dark watery stools.

Æthusa cyn—Spasms, with stupor, delirium; turning of the eyes downward; epileptiform spasms with clenched thumbs, red face; dilated, staring immovable pupils; foam at the mouth; children cannot stand or hold up their head.

Agaricus.—Spasms, with tremor of the body; involuntary movement while awake.

Apis mel.—Nervous restlessness; convulsions; trembling and jerking of the limbs; shrieking; boring the head in the pillow; cerebral affections.

Arnica.—Spasms in consequence of a fall or other injury.

Arsenicum.—The child lies as if dead; pale, but warm; is breathless for some time; finally it twists its mouth, first to one side, then to the other; a violent jerk appears to pass through the whole body, and respiration and consciousness gradually return.

Belladonna.—Starting from sleep, with a wild look, dilated pupils; heat of the head and hands; red eyes and flushed face; sopor after the spasms. Convulsions may commence in arm, and then the body be thrown forward and backward.

Bryonia.—Spasms developed through repercussion of measles.

Camphora.—Spasms from suppressed catarrh of the head or chest.

Causticum.—Convulsive motions of the upper part of the body, with feverish heat and coldness of the hands and feet. Convulsions of the extremities in the evening when the child is sleeping, with distu eyes and icy coldness of the body.

Chamomilla.—Child makes itself stiff and bends backwards; k with the feet and screams immoderately. Convulsions where legs move up and down; grasping and reaching with the hands; mouth drawn from side to side; eyes staring, jerking, and twitching even in sleep. The nurse may have had a fit of anger which causes the convulsions of the child.

Cicuta vir.—Violent shocks through the head, arms, and legs, which cause them to jerk suddenly; spasmodic rigidity of the body, either opisthotonos or emprosthotonos. The child seems well and in great spirits, when suddenly it becomes rigid, then relaxation sets in with great prostration. Tonic spasms, renewed from the slightest touch, or the least talking or walking about.

Cimicifuga.—Children wake at night with a frightened look and trembling of the limbs.

Cina.—Convulsive attacks at night; spasms of children, with throwing the arms from side to side; convulsions of the extensor muscles; the child becomes suddenly stiff; there is a clucking noise as if water was poured out of a bottle, from the throat down to the abdomen.

Coffea.—Convulsions of teething children, with grinding of teeth and coldness of limbs after over excitement; weakly and excitable children.

Cuprum.—Eclampsia of children during dentition; the spasm is often preceded by violent vomiting of phlegm; the clonic spasm begin in the fingers and toes; child lies on belly and spasmodically thrusts the breech up; after the convulsion the child screams, and turns and twists in all directions till another spasm occurs.

Cuprum acet.—Spasms from retrocession of the eruption in scarlet fever.

Gelsemium.—Convulsions from reflex irritation.

Helleborus.—Convulsions of nursing children, with extreme coldness; the urine is very dark, and has a sediment like coffee grounds; intense and intolerable pain in the head.

Hyoscyamus.—Convulsions after meals; child sickens after eating, vomits or shows distress at the stomach; sudden shrieks and then insensible. Convulsive jerks; long-lasting spasms; frothy at the mouth.

Ignatia.—Spasms return at the same hour every day; screaming and violent trembling all over; single parts seem to be convulsed; spasms of children, preceded by hasty drinking; convulsive twitchings, especially after fright or grief (of the nurse); convulsions during dentition, with frothing at the mouth; kicking with the legs.

Hepar sulph. cal.—Traumatic convulsions, caused by excessive pressure on the brain during delivery; trismus of new-born babes.

Ipecacuanha.—Much nausea and vomiting, either before or during a spasm; the child is spasmodically drawn in some direction; body rigid, stretched out, followed by spasmodic jerking of the arms; convulsions from indigestible food or from suppressed eruption.

Kreasote.—Convulsion from the swelling of a gum over a tooth which is not quite through; great restlessness, wants to be in motion all the time, and screams the whole night; bronchial irritation from dentition; teeth look black and decay as fast as they appear.

Laurocerasus.—Much gasping for breath before, during or after a spasm, with bluish tint of the skin; after fright; emaciation.

Lycopodium.—Spasms from incarcerated flatus, with screaming, foaming at the mouth, throwing the arms about; unconsciousness.

Mercurius.—Convulsions with cries, rigidity, bloated abdomen; itching of the nose and throat; worse at night from suppressed salivation.

Nux vomica.—Convulsions in the child from indigestion, especially through the high living of the nurse, from emotions in the nurse as anger; the spasms begin with an aura in the epigastrium; spasms renewed by the least touch, followed by deep sleep.

Opium.—Spasms from fright (in nurse); in children from approach of strangers; in new-born babes screaming before or during the spasm; after attack deep sleep; stupor between spasms.

Silicea.—Spasms which return at the change of the moon or at night; convulsions after vaccination; attacks preceded by coldness of the left side, shaking, and twisting of the left arm.

Stannum.—Spasms during dentition, with worm symptoms, more excitability, mere disturbance of the brain, and more fear than in *Cina.*

Stramonium.—Suppression of an eruption, or the exanthem fails to come out; the child is afraid and shrinks back from objects on first seeing them; opisthotonic convulsions from bright dazzling objects, water or touch; abdomen puffed; body very hot; spasms continually change character.

Tart. emet.—Spasms from repelled eruptions, with paleness
skin and much difficulty of breathing; great prostration and f

Veratrum alb.—Convulsions of children, with pale face
sweat on forehead; cough before or after the spasm; trem
over.

Zincum.—Twitching in various muscles, the whole body of the child jerks during sleep; the child is cross before attack; body hot; restless at night; fidgety feet; right side twitches; pale children during teething. Compare Tetanus.

NIGHT TERRORS.

It happens sometimes that a child who has gone to bed apparently well, and who has slept soundly for a short time, awakes suddenly in great terror, and with a loud and piercing cry. The child will be found sitting up in its bed, crying out as if in an agony of fear, "Oh dear! oh, dear! take it away! father! mother!" while terror is depicted on its countenance, and it does not recognize its parents, who alarmed by the shrieks, have come into its room, but seems wholly occupied with the fearful impression that has aroused it from sleep. By degrees consciousness returns, the child now clings to its mother or its nurse, sometimes wants to be taken up and carried about the room. As the terror abates, the child in some instances becomes quiet at once, but frequently it bursts into a fit of passionate weeping, and sobs itself to rest in its mother's arms. In some instances, a quantity of limpid urine is voided as the fit passes off, but this occurrence is by no means constant. Usually the remainder of the night is passed in tolerably sound sleep, and the following night the child may rest undisturbed; or the terrors may again return, and with precisely the same symptoms as before. The attack usually comes on after the child has been half an hour to a couple of hours asleep, and two attacks do not generally occur in the same night. They are always more or less distinctly associated with the impression of some object which occasions alarm, as a cat or dog which is fancied to be on the bed; and this illusion continues even after the child has recognized those around it. Seizures of this kind may continue to return for many weeks together, or may occur for a few times. They are never the indications of primary mischief in the brain, but are always associated with some disturbance of the intestinal canal; gastric disorder, constipation, etc. (West.)

The *treatment* of night terrors consists in regulating the diet and in the selection of the similar remedy. The child should have a light supper and be given a drink of water on retiring. It should have no excitement after supper and should retire early.

Belladonna.—Screaming and starting in sleep; flushed face, injected eyes.

Borax.—Awakening with screams as if in affright, clinging to something as if afraid.

Cina.—Shrieking out during sleep. Inordinate appetite or no appetite, refuses what is offered in a whining, petulant manner. Tossing about restlessly when awake.

Stramonium.—Calls for papa and mama, although they are present and trying to console; delirium.

Sulphur.—Screaming when getting awake. Fitful appetite.

The totality of the symptoms may lead to some other remedy, see Bulimia, Indigestion, Convulsions, etc.

TRISMUS AND TETANUS—LOCKJAW.

Tetanus is a motor-neurosis which shows itself in a tonic contraction, sometimes of isolated muscles, sometimes of the whole muscular system. When it occurs only in the masseter muscle it is known as trismus. Trismus and tetanus usually occur together in children, the latter being always accompanied by trismus, though the former may be observed without tetanus. Up to the present time post-mortem examinations have not yielded any results by which has been established any lesion that can be regarded as the essential of the disease.

In new-born children (*trismus neonatorum*) there appears some time between the third and eighth day after birth, after such premonitory symptoms, as restlessness, whimpering, broken sleep, an inability to open the mouth. The features are altered, the lips stretched apart, the eyes shut close, and the alar cartilages move tumultuously. Gradually the spasms extend with intermissions down the neck, and spinal muscles, finally even to the extremities, so that the child lies still like a statue, and may be lifted like one. From the inability to suck or take nourishment, the patients visibly emaciate, the intervals between the paroxysms become more seldom and shorter, the pulse rises to 140 or 160, a cold, clammy sweat breaks out over the skin, and death results in a few days, at the outside eight after the onset disease. Tetanus in more advanced children occurs either or along with lockjaw as it may be ushered in by certain prem symptoms as irritability, dragging pains in the neck, transient ings, pains in the throat and impeded movements and voice. Trismus and generally tetanus follow rapidly. The muscles of the neck trunk and extremities are stiffly contracted, any action or passive movement of them being impossible, while sensibility is increased or unaltered. The temperature is generally increased during the further course of the disease, though at approaching death it sinks below the normal line; the pulse is frequent, small, and later on it is irregular as is also the breathing. Opisthotonos is the most frequent form in which the body is stiffly stretched out. At first paroxysms alternate with remissions, but gradually the former become permanent, or at most become only temporarily relaxed, into slight convulsive tremors. The result is usually fatal in a few days, or in from two to three weeks, though exceptionally the disease ends in recovery. (Steiner.)

The *treatment* will necessitate careful examination. Some of the following remedies may be needed :

Acid hydrocyan.—Tetanic spasms, with lockjaw, bloating of face and neck; protrusion and glistening of eyes; immobility and dilatation of pupils; bluish red color of face; frequent pulse; rigidity of limbs; trunk bent forward or backward; convulsions from congested condition of cerebral vessels.

Aconite.—Frequent alternations of redness and paleness of face and distortion of eyes; opisthotonos; upper and lower limbs drawn in; hands and thumbs clenched; eyes drawn upward; face covered with cold sweat; twitching in thighs; rigidity of muscles of jaws and neck.

Ammonium carb.—Tetanic or epileptic convulsions from violent cerebral irritation; feeling as if head would burst; pale, bloated face; anxiety with inclination to weep; pulse hard, tense, and frequent; great sensitiveness to cold.

Angustura.—Trismus, with convulsions of the muscles of the back; twitchings in top of shoulder; oppression and spasms of chest; heat and bluish redness of face; tension of muscles of face; lips drawn back showing teeth; thirst, but no desire to drink; pulse spasmodic, intermitting, irregular. This has also cured tetanus.

Arnica.—*Traumatic tetanus;* short, panting, breathing jerks and shocks as if produced by electricity, tremor of limbs; crawling pricking in the part; heat of face, cold body; internal chilliness, with external heat; pulse variable, mostly hard, full and quick.

Arsenicum.—Tetanic spasms, with frightful concussion of the limbs; patient lies as a dead person, but warm with hands clenched, the arms slowly drawn up and down, features distorted, breathing imperceptible; stiffness of limbs, particularly of feet and knees; longing for cold water, acids, or alcohol; sudden shrinking of strength; pulse frequent in the morning, slower in evenings; skin dry like parchment.

Belladonna.—Trismus, with painful construction and narrowness of face, oppression of chest, labored, irregular breathing, delirium and sopor; drawing and stiffness in neck and spine, spasmodic contraction in tongue; yawning and vertigo; painful stiffness of muscles of mastication, with convulsions in limbs, and chilliness; contortion of eyes, extension of extremities, violent distortion of all extremities; opisthotonos, pleurosthotonos, especially to left side; paroxysms of stiffness and immobility of limbs, or of a single limb, or aggravation from slightest contact. *Trismus infantilis* with sudden starting and drawing together of body and limbs; twitchings, strabismus; inability to swallow, and finally severe spasms; anxious, spasmodic respiration; dilated pupils; motionless, staring eyes; involuntary discharge of fæces.

Camphora.—Tetanic spasms, with loss of consciousness; limbs extended and fixed, head bent sideways, lower jaw rigid and wide open, lips drawn inwards, increasing distortion of muscles of face, coldness all over body; oppressed anxious, panting breathing; trismus; sudden and great sinking of strength, pulse small, weak, slow; cold perspiration, often clammy, and always very debilitating.

Cicuta vir.—Trismus and tetanic rigidity from injuries inflicted upon head and spinal column; deadly paleness of face, with coldness of face and hands; throat feels closed, inability to swallow; spasms of muscles, especially of neck and chest; pulse weak, slow, trembling. Complication of meningitis cerebro-spinalis.

Cuprum.—Paleness of face, spasmodic contraction of jaw, foam at mouth, jerking of limbs, with distortion; vomiting; opisthotonos, with the limbs spread out to the sides, and the mouth open; rigidity of limbs and trunk; jaws closed with *loss of consciousness;* redness of eyes, ptyalism and frequent micturition.

Hyoscyamus.—Alternate convulsions of upper and lower extremities; contraction of extremities, and tossing of body upwards; eyes staring and distorted, with spasmodic closure of lids, bluish face, clenching of teeth, foaming at mouth, constriction of throat, drawing of neck to one side, rigidity of hands, contortions, and spasmodic curvings of body.

Ignatia.—Emotional trismus or opisthotonos; head drawn powerfully back, countenance livid, pupils dilated, respiration and deglutition of fluids difficult.

Laurocerasus.—Hippocratic countenance, disposition to clench the jaws, spasmodic constriction of larynx, staring eyes, foam at mouth, stiffness of neck, twitching about the head.

Lycopodium.—Drawing of head toward right side, with stiffness of neck, face, and jaw; dizziness, heaviness of head; weak eyes; dry and stuffed up nose; dry, difficult stool; depression of spirits; restless sleep with anxious dreams.

Moschus.—Stiffness of body, with *full consciousness;* spasms in abdominal muscles.

Nux vom.—Tetanic convulsions, alternating with violent concussion of whole body; violent convulsions of body, with extreme rigidity of limbs; dyspnœa from drawing in of the muscles of chest, with distorted eyes and redness of face. Spasmodic attacks from the merest touch; alternate trismus and opisthotonos; frightful convulsions, particularly opisthotonos; frightful convulsions, particularly opisthotonos, returning and abating several times in one minute, with *full consciousness;* violent convulsions, lasting from one to two minutes, all the muscles becoming suddenly stiff, jaws clenched, frequent and irregular pulse; profuse sweat; opisthotonos, with feeble beating of heart, pulse small and scarcely perceptible; spasms preceded by violent chills and shudderings.

Opium.—Twitching of facial muscles, distortion of mouth, trismus, with irregular, difficult respiration, spasmodic trembling of limbs, foaming at mouth, flushing of face, unsteadiness of eyes, quivering of lips and facial muscles; tetanic spasms, with opisthotonos and rigidity of the whole body, the trunk curved in form of an arch.

Physostigma ven.—Has produced relaxation of tetanic muscles of trunk and limbs.

Phytolacca.—Stiff extremities; hands firmly shut; feet extended and toes flexed; pupils contracted; teeth clenched; lips everted and firm; general muscular rigidity; respiration difficult and oppressed; convulsive action of muscles of face and neck, followed by partial relaxation, and then again tetanic condition.

Rhus tox.—Injuries inflicted in ligamentous parts; rheumatic trismus and tetanus; rigidity as from contraction of tendons; tingling and twitching of limbs; opisthotonos with great languor; oppression of chest; contraction of fingers; pale, sickly countenance.

Stramonium.—Tetanic convulsions excited by the sight of a sparkling object; the eyes of the patient glisten and sparkle; grinding of teeth, muttering; oppression of chest; violent motion of limbs, with stretching and trembling of the hands, clenching of thumbs.

Veratrum album.—Pale hippocratic countenance trismus; grinding of teeth; spasmodic constriction of œsophagus, with contracted pupils; spasmodic constriction of the palms of the hands and the soles of the feet; twitching of eyes; paroxysms preceded by anguish and despair. Compare Convulsions, Meningitis, etc.

IODIOCY AND IMBECILITY.

This is an arrest of mental development by reason of some defect of cerebral development which is either congenital or occurs soon after birth. Marked imperfections of the brain are undoubtedly met with in idiots. It is sometimes abnormally small, the general arrest of growth being due either to some condition of defective bodily nutrition, or to a premature ossification of the sutures of the skull and a constant prevention of the growth which normally takes place actively during the first years of life. While it may be that there is no other defect than the abnormal smallness, it happens much more frequently that there are other anomalies, as hydrocephalus, unequal size of the hemispheres, and deficient development of the convolutions. All degrees of unequal size of the hemispheres have been met with, from that slight difference which is natural, to that extreme degree where a whole hemisphere has been replaced by a meshwork filled with fluid. Again, there is scarcely a part of the brain which has not occasionally been found wanting; the corpus callosum may be defective or absent; there may be a deficient development of the anterior lobes, and a simplicity of the convolutions, such as belong to the lower animals; or the posterior lobes may not extend far enough back to cover the cerebellum, as normally they do not in some monkeys, and in all the animals below them. Chronic hydrocephalus, apparently primary in some cases, but in many others secondary to the atrophy or defect of the brain, is frequent in idiots, and sometimes makes them large headed.

Etiology.— The causes of idiocy are sometimes traceable to parents. Frequent intermarriages in families lead to a degeneration that manifests itself in deaf-mutism, albinoism and idiocy; parental intemperance and excess, according to Dr. Howe, occupy a high place as causes; and the natural term of insanity proceeding unchecked through generations is as Morel has shown, sterile idiocy. During fœtal life great fright or mental agitation in the mother, or irregularities or excesses on her part may lead to mental defect in the child. But, perhaps, the most frequent causes of an arrest of mental development are those which operate after birth up to the third or fourth year; they are epilepsy, the acute exanthemata, perhaps syphilis, and certainly conditions of bad nutrition, such as are produced by overcrowding, diet and want. Cretinism is an endemic idiocy arising out of unknown territorial conditions. (See p. 100).

Symptoms.—The extremest idiots are destitute of any intelligence whatever; they are apathetic, torpid beings, having a human semblance whom it is necessary to feed, to move, to clothe, to take care of in every particular; who can attend to nothing and remember nothing; who cannot speak a word; who grunt, make unintelligible sounds, and are unquiet if their appetites are not satisfied, or mechanically continue some automatic movement of hand, head, or body. The senses are almost invariably defective or wanting, the sensibility of the skin being commonly very imperfect, the hearing feeble, and smell and taste so deficient or perverted that the acrid or filthy matters are eaten with indifference. The muscular development shares in the general defect; there are cramps of the limbs, contractions or paralysis of certain muscles, and epileptic convulsions.

In less extreme cases there is evident want of power over the muscles, the walk is staggering and uncertain, the eye rolls vacantly, strabismus is common, speech is defective and there is slavering at the mouth. Sexual power is absent in the worst cases, and notwithstanding the self abuse practiced by some idiots, feebleness is in all cases more common than excess. At the other end of the scale stand the so-called *imbeciles*, the highest of whom are only a little lower than those simple-minded people not deemed imbecile. The difference between imbecility and idiocy is only one of degree, so that it is impossible to define it. In all sorts and conditions of idiocy two principal types may be broadly distinguished; one embracing the torpid and apathetic beings, who have usually some bodily deformity, and who give feeble signs of life; the other, those lively and excited beings, who, rarely observably deformed, are unquiet and restlessly respondent to a rapid succession of impressions, who shriek, laugh weep, gesticulate, clap their hands, get into mischief, and sometimes pass by a turbulent declension into true maniacal fury. Even the quiet idiots are occasionally liable to sudden attacks of fury, in which they bite, shriek, scratch, kick, etc.

Though idiots can never reach a normal development, their condition in many cases may be much improved by persevering training, and the faculties which they do possess may be brought out in a remarkable manner, and they be made automatically skillful in certain tasks. When epilepsy has coexisted with the idiocy and has afterwards disappeared, marked improvement may take place. (Maudsley).

Treatment.—The first thing to be done is to remove the cause or antidote it if possible. If lack of development is the chief cause, *Calcarea phos.* will work wonders. Dr. Bowen reports marked success with *Phosphorus* 2x trituration in developing an idiotic child. Other remedies may be indicated as *Belladonna*, *Helleborus*, *Hyoscyamus*, *Lachesis*, *Opium*, *Sulphur*, *Anacardium*, *Crocus*, *Nux mosch.*, *Nux vom.*, *Mercurius*. Proper feeding and judicious careful training, as in an Institution for the Education of Feeble-Minded Children, will help to make the most out of these cases.

INFANTILE PARALYSIS.

This disorder attacks children indiscriminately, without any regard to sex, between the ages of six months and two years, at the time of the first dentition more especially; and is a great source of shrivelled half-dead limbs, club feet, and other sad deformities.

Etiology and Symptomatology.—The onset of the disorder is generally sudden and unexpected. The child is put to bed well and in the morning it is found to be paralyzed. Others fall suddenly sick, with exhibition of heat, congestive and irritable state, fever, frequent crying, and where difficult teething is added, the further attendant effects thus induced. Or the paralysis may be grafted upon some marked febrile disorder, as gastric or remittent fever, measles or typhus; or upon some other malady, as hooping cough or pneumonia. Now and then but only in exceptional cases, the disorder may be ushered in by convulsions or drowsiness. (Radcliffe)
malady has continued for a longer or shorter time, w
ess violence, and with or without convulsions, a ren
symptoms occurs, and the child whose life was before in
rests quietly though pale and exhausted, and looks aroun

just awakened from a deep sleep. Its parents begin to rejoice in the hope of its restoration, when they discover with alarm that their child is paralyzed either in all its extremities, or in one or both legs, or merely in a single arm or a single leg. In the course of four to eight weeks, a reduction gradually occurs in the paralytic effects; if in the outset *all* the muscles of the extremities were paralyzed, at a later period only those of one side, or an arm and leg of different sides, or the upper part of an arm and thigh, or one only of these, or a calf and a foot, or the lower part of an arm and a hand, or the muscles of the back alone, remain paralyzed. The sensibility of the paralyzed parts continues almost normal. (Meyer). Sensation in the affected limb appears to be exalted when the paralysis is recent, the degree of hyperæsthesia in the early stage being in such cases proportionate to the loss of power which afterwards is apparent. In some instances the exaggerated sensibility continues for several weeks, though this is unusual; and when this is the case, the leg being the seat of the affection, and the paralysis incomplete, the existence of hip joint disease may be suspected. In such a case the child bears all his weight on the healthy limb, turns the foot of the affected side inwards when walking, and stands with the toes of that foot resting on the dorsum of the foot of the affected side. (West). The temperature of the affected members, after the first attack soon sinks from the normal height lower and lower, and the legs, particularly the thighs become cold and bluish. While as years are added, the longitudinal growth of the paralytic extremities generally proceeds with tolerable regularity; the atrophy of the affected parts, which soon follows the paralysis, increases. The trochanters, the knee-pans and the scapula remain imperfectly developed; the tubular bones have a smaller circumference than in their normal condition; in some cases, the bones are also deficient in their longitudinal growth, and their ligaments are relaxed. Two or three years after the attack, when the little patients begin to put their paralyzed extremities again in motion, distortions arise, brought on by the use of the enfeebled muscles, such as pes varus, valgus, equinus, calcaneus paralyticus; genu recurvatum, inversum, paralyticum, etc. The physiological cause of their origin is as follows: Since all the muscles of the paralyzed parts have not lost their elasticity fully or to an equal degree, at every movement those muscles which still possess some vitality, having no opposition to overcome on the part of the antagonist muscles, undergo a gradual shrinkage; and thus and thus in the end one or another, and sometimes several kinds of deformity are contracted by the same person. Thus when the dorsal muscles are paralyzed, the continuance of a sitting posture induces lordosis, and when the lateral muscles are not equally paralyzed, scoliosis. Upon the general health and the duration of life these paralyses exercise no detrimental influence; on the contrary they frequently are attended with an inclination to a premature physical development, and with a certain immunity against other diseases, in particular those of an epidemic character. (Meyer). The duration of infantile paralysis is very variable. It may pass off in a few days, or even a few hours; it is more likely to occupy several weeks or months in this process ot improvement. Improvement, to a greater or less degree, is indeed the rule, and not the exception; and it may even be said that the cases which stop far short of recovery are by no means common. (Radcliffe). Adams says, "It is generally supposed that unless recovery takes place within a few months, the paralysis is persistent through life; but I have seen many cases in which improvement has proceeded to a very useful extent, several years after the seizure."

That the kind of paralysis just described belongs to the class of spinal paralysis, depending on spinal congestion is thought by Adams and Meyer to be shown by the perfect integrity of the functions of the brain — the occurrence in special cases of a paralysis of the upper arm or thigh, without the contemporaneous paralysis of the lower arm and hand, or the leg and foot — the quickly following emaciation of the paralyzed parts, and the simultaneous check in growth — the late origin and gradual increase of distortions in form, and the exaggeration of sensation. The treatment of the deformities, especially of club foot, resulting from infantile paralysis is a subject of much practical interest and difficulty. The existence of paralysis is supposed to contra-indicate any surgical interference; but from these apparently hopeless and essentially incurable cases, some of the most striking and valuable results are obtained by the combination of surgical and mechanical treatment, viz., tenotomy, mechanical appliances and a subsequent compensation for the existing paralysis by mechanical support, varying in different cases. At the same time very satisfactory results have been obtained by the employment of electricity, in connection with massage, shampooing, and movements of various kinds. (Adams). *Gelsemium* or *Causticum* will aid the cure.

FACIAL PARALYSIS.

Etiology.—Paralysis of the muscles supplied with motor power by the facial nerve is frequently met with as a temporary condition in infants who have been delivered by forceps as a result of pressure of the blade of the instrument upon the nerve as it emerges from the cranium. It is by no means rare, however, during childhood, and either appears suddenly after exposure to cold, when it is possibly due to pressure caused by congestion and swelling of the tissues around the stylo-mastoid foramen; or more gradually, when it is usually due to pressure from an enlarged gland, or to disease of the petrous portion of the temporal bone. (Meigs & Pepper). Dr. West observes that the facial hemiplegia is quite independent of any injury to the brain, and is the result of injury to the nerve from application of the obstetrical forceps, or from injury received during the passage of the head through the pelvis, without any instruments having been employed.

Symptomatology.—It is not always easy to discover the facial paralysis of infants, for it causes little deformity. During repose, the symmetry of the face is scarcely altered and the half-closed eye seems to be the only characteristic of this disease. But this is altered when the child cries; the features are distorted the commissure of the lips drawn towards the healthy side, and suction is very difficult. The uvula and the tongue are not affected by the paralysis. (Bouchut). Other cases, however, there are in which the symptoms are striking. The eye upon the affected side remains open; the power of knitting the forehead and of raising the eyebrow is lost; the angle of the nose and mouth on the same side hang down; tears trickle over the cheek; the conjunctiva is injected or inflamed and saliva dribbles from the mouth.

Diagnosis.—The possibility of mistaking simple facial paralysis for hemiplegia from cerebral hæmorrhage must be borne in mind. In hemiplegia of cerebral origin, the paralysis is usually ushered in by convulsions and coma; the frontalis and orbicularis muscles are not paralyzed, but the muscles of the face usually are, and the tongue is pushed toward the paralyzed side, and finally there is loss of power in the arm and leg on the same side.

Prognosis.—When the paralysis is due simply to exposure to cold, pressure of instruments, etc., a cure may be expected, although sometimes tedious, but when it depends upon disease of the temporal bone, the prognosis is usually unfavorable. (Meigs & Pepper).

Treatment.—*Causticum*, *Ignatia*, *Aconite*. *Bell.*, and in some cases *Cuprum*, *Nux*, *Opium*, or *Silicea* may be indicated. The galvanic current will aid the cure.

PARALYSIS OF THE DELTOID.

Paralysis of the deltoid is a rather rare accidental disease. The following is an instance observed by M. Jacquemier sufficiently describes it:

A strong and well constituted child, born after a long and tedious labor, presented a difference between the two upper extremities. The two arms were equally well developed, but the right was as if pendant, and kept itself close to the trunk; the shoulder appeared a little flattened and less rounded. The arm when raised fell back inert, contrasting with the opposite limb. The movements of the hand and of the forearm were freely exercised, but the arm itself could only be moved a little backwards and forwards. The disorder disappeared completely at the end of twenty days. He attributed it to compression of the axillary nerve against the humurus, at the spot where it is applied to the deep surface of the deltoid muscle.

Treatment.—*Rhus.*, *Sanguinaria*, and *Ferr. phos.* are the remedies that have cured this form of paralysis.

PSEUDO-HYPERTROPHIC MUSCULAR PARALYSIS.

This occurs in children up to the age of thirteen or fourteen, mostly in boys. No causes have as yet been made out; but its occurrence in several children of the same family, or nearly related to each other, has been established. Hereditary transmission of the tendency to it appears to have been observed only on the mother's side; that is to say, when the parents of children having it were not subject to it, examples have been found in the mother's family; her brothers, etc. The first well marked symptom is muscular weakness of the lower limbs and back. This gradually increases. The child stands with the legs far apart, the shoulders thrown backward, and the be
ward. The toes point downwards, sometimes approximating
equinus. In the course of a few months some of the muscles
lower limbs will be found to be enlarged; and this gradually e

to those of the trunk and upper extremities. Sometimes those of the face also are involved. The enlargement of the muscles of the calves of the legs, in many instances gives an appearance like that of extraordinary strength; and yet the limbs are almost powerless for locomotion. In from one to three years, paralysis extends to nearly all the muscles of the body. An impairment of the mental faculties has been noticed in a number of cases. In this condition, unable to rise from the position in which he is placed, the child may live for several years more; seldom to adult age. Sensation is not involved in this disease; neither are the functions of digestion, respiration, or circulation.

Greisinger and Billroth ascertained the presence of deposits of fat in the enlarged muscles, in this affectation. Duchenne and others have observed also the great increase of connective tissue, along with atrophy of the muscular fibres. It is altogether a degenerative, not a hypertrophic alteration that the muscles undergo. Several facts in the history of this disorder point to a nervous origin. It is symmetrical and progressive upon both sides of the body alike, the intelligence is not infrequently impaired, it presents an analogy (notwithstanding that shrinking occurs in the one and increase of bulk in the other) to progressive muscular atrophy; in which lesions of the spinal cord and sometimes of the sympathetic ganglia, have been demonstrated. (Hartshorne.)

Treatment.—The symptoms must decide the choice. In the absence of clinical experience, the following may be needed: *Bell.*, *Caust.*, *Cocc.*, *Nux.*, *Sulph.*, *Phos.*, *Rhus tox*, *Secale*, *Plumbum*. (See Kershaw on Diseases of the Nervous System.)

CHOREA. ST. VITUS' DANCE.

Chorea is a non-febrile, convulsive disease, characterized by irregular and imperfectly co-ordinated, but not completely involuntary contractions of the muscular system, and particularly that of the extremities. There are irregular clonic movements of the voluntary muscles, and weakness more or less approaching to paralysis in the same parts.

Without being very rare chorea is certainly not of very frequent occurrence. For the most part it attacks children between the tenth and fourteenth years of age, who have not reached the time of puberty. Up to nine years of age the two sexes appear to be equally liable; after this age females become much more liable than in males proportion of five to two.

Etiology.—The patients who suffer from chorea, says Dr. Hillier, are very impressible and emotional, and are the subject of previous or inherited derangements of the nervous system. Rapid growth and second dentition probably act as predisposing causes. Some special cause of irritation may be suspected in some cases, as worms in the intestines or unnatural irritation of the sexual organs. One or two cases are on record in which choreic symptoms have ceased almost abruptly on the expulsion of a tapeworm. In not a few cases there has been reason to know or suspect the existence of practices which might lay the foundation of genital congestion, and give rise to any amount of irritation, and this too in cases where the age of the patient might be supposed to be a sufficient contradiction to the notion. Again, the causes of chorea and rheumatism would seem to to be closely allied, if not identical. (Radcliffe). Rheumatism is unquestionably the condition in connection with which chorea occurs far more frequently than with any other, or perhaps than with all others conjoined. The evidence of all observers of experience is unanimous upon this point. See asserts that one-half the cases of chorea are dependent upon the rheumatic poison. Trousseau also states, that in his experience rheumatism was undoubtedly the cause of chorea, and Roger asserts their connection even more strongly, and states that "the coincidence of chorea and rheumatism is so common a fact that it ought to be regarded as a pathological law, just as much as the coincidence of heart disease and rheumatism."

Anatomical Lesions.—It would appear that as yet we are unacquainted with any truly characteristic lesion in chorea, and it is highly probable that all cases of so-called chorea, will never be found to be invariably associated with any one anatomical lesion. A number of lesions are recorded which evidently refer to cases of organic disease of the nervous centres which were merely attended with choreoid symptoms. Among these are enlargements of the adontoid process, effusions into the arachnoid, tumors in the substance of the brain, abscess in the cerebellum, bony plates upon the spinal meninges, and many other disconnected lesions. The appearances met with after death in a few instances only, tend to confirm the view of choreic lesion being caused by embolism, and localized in the sensori-motor ganglia. It is evident that the determination of this question presents great difficulties, from the fact that fatal cases of chorea are comparatively rare.

Symptomatology.—The disease may be general or partial; in the first case it affects all the limbs, the face, and some of the muscles of the trunk; in the second it implicates only one side, the upper extremities, or a single member. It is doubtful whether there are as a general rule, any well marked prodromic symptoms. The only ones that have been mentioned with any authority are irritability and peevishness of the temper, an unusual degree of impressibility, languor, debility, disturbance of the organic functions, exhibited by a deranged appetite, and an irregular state of the bowels, and after a time, a certain quickness and irregularity of the movements which mark the commencement of the characteristic symptoms of the malady. (Meigs & Pepper). The movements are the characteristic feature of chorea. They are clonic spasms unattended by pain and as Hillier says, " something like the movements of a child put out of temper." Usually they are more marked on one side of the body than on the other, and at first they may be confined to one side. Not unfrequently they make their appearance first in one arm, then in the leg of the same side, then in the face, then in the arm and leg of the other side. They are always increased by any attempt to exercise the will, or under any emotional excitement; and they are for the most part, put a stop to by sleep. (Radcliffe). When the disease has become fully confirmed, the movements are exceedingly diversified and irregular. The limbs are agitated by involuntary contractions of the muscles into every attitude possible for them to assume. The fingers are open and shut, brought together or separated, without any regularity. The arms are flexed and extended upon the forearms, or pronated and supinated, whilst the forearms are flexed or extended upon the arms, and the arms moved at the shoulders into every imaginable position. Such are the irregularity and rapidity of the motions that it is often with great difficulty that the patient can seize anything with the hands, and when the object is attained, he frequently cannot do with it what he wishes. This imperfect controover the hands and arms sometimes prevents the patient from carrying food and drink to the month, excepting with the utmost difficulty, and may make it necessary to feed the child. Walking is always more or less difficult, and in some severe cases impracticable. The patient totters from side to side, or walks rapidly a short distance, and then suddenly stops. Sometimes the progress is in a zigzag direction, and at others by fits and starts as it were, while in others again, the walk is rapid and sudden, almost a run. The child often falls while walking or running, either from meeting a slight obstacle, or in consequence of the irregular and imperfect muscular action. The face is distorted into all kinds of expression, so that it assumes by turns, that of the most opposite emotions—sadness, terror, joy or grief. The mouth is opened and shut, or its corners drawn apart, with the greatest irregularity; the tongue is occasionally protruded between the teeth, sometimes moved rapidly in the mouth, so as to cause a clacking sound; the lower jaw is depressed and elevated, or moved in a lateral direction. In consequence of the irregular motions of the tongue and mouth, articulation becomes difficult and the child either stutters, or speaks slowly and badly, or can pronounce only monosyllables. The head is moved rapidly from side to side, or backwards and forwards, or undergoes constant rotation. (Meigs & Pepper). Numbness is sufficiently marked in many cases to be detected, especially in the parts in which the movements are most marked. Trousseau says that numbness, when present, is usually accompanied by tingling. The vacancy of expression resulting from the semi-paralyzed condition of the features, which may be so extreme as to suggest the idea of idiocy, must not be taken as the guage by which to measure the mental condition of the patient. Matters mentally are certainly not so bad as they look; still there is always more or less dulness and listlessness.

Chorea is essentially a feverless malady. Not unfrequently, also, there are signs which point to a condition the very opposite to that which is met with in fever, such as coldness and clammyness of the hands, a disposition to chilblains if the weather be at all cold, and pastiness or puffiness of certain parts of the skin. Generally the urine is neutral of high specific gravity and readily becomes offensive.

In its most trifling form, chorea may be nothing more than a grimace, or a shrug of the shoulders, or a catch in the speech, or some other odd or awkward involuntary movement, which in many instances appears to be little more, or no more than an unchecked bad habit. In its gravest form, on the contrary, the patient tosses ceaselessly too and fro, unable to walk or even stand, turning, writhing dashing about, and only kept in bed by being strapped down: without speech, the lips injured by being drawn into the mouth; the elbows and hips and other prominent points made raw by constant rubbing against the bedding, for no one can keep the bedclothes in their place, sometimes raving, and never sleeping, until death comes to the rescue.

The course of chorea is acute or chronic. In a large majority of cases it is acute, the symptoms becoming more and more violent until they reach their height, when they remain stationary for a time, and then subside and disappear under the influence of treatment, or in the natural course of the malady. It has been frequently noticed that when an acute febrile or inflammatory disease is developed during the course of chorea, the spasmodic movements are very apt to diminish or entirely cease for the time. Relapses are quite common and are said by Trousseau to be shorter than the original attack.

Electric chorea is the name given to an exceptional form, in which certain choreic or convulsive shocks occur in the limbs, repeated with a certain regularity of rhythm, persisting with scarcely any intermission for days or even weeks and followed by paralysis and atrophy of the limbs; or manifests itself by certain tonic convulsions of great violence in which the choreic character is displayed.

Treatment.—The remedies for chorea are usually sharply indicated. *Causticum* has cured more cases than any other remedy. The follow- are the chief indications:

Aconite.—After a fright and the child remains unnaturally timid; unusual fatigue may have been the cause; much trembling of the extremities. It may have resulted from exposure to a very cold, dry atmosphere.

Agaricus m.—Itching spots on the skin like chillblains; a variety of involuntary movements in the waking hours; perfect freedom from them during sleep.

Belladonna.—The motions of the body are generally backwards, sometimes quite extreme, boring of the head into the pillow; grinding the teeth; moaning; injected eyeballs; flushed face usually attends the development of other symptoms.

Calcarea c.—In luecophlegmatic children; after a fright the child falls down easily, during second dentition.

Causticum.—Child not exempt at night, often prevents sleep; right side of face and tongue often paralyzed; twisting and jerking of the limbs; constipation.

Cina.—Very peevish and irritable; picking of nose; ravenous appetite; urine turns milky on cooling, child loses its playfulness, and has no pleasure in anything.

Cicuta.—The attacks twist the child in the most curious and sometimes frightful manner, sometimes causing it to scream out.

Cimicifuga.—Besides the twitching and jerking there are nervous tremors apparent; the motions are constant, but confined to one side; all quiet during sleep; great difficulty in swallowing; often confined to the left side.

Cocculus.—Right arm and right leg principally affected; all quiet during sleep; legs become more and more useless.

Crocus.—Jumping, dancing, laughing, whistling; very affectionate, wants to kiss everybody; nose bleeding of dark stringy blood.

Cuprum.—The twitchings and jerkings are often perceived to commence in the fingers; cramps often; often affect only one side; the attacks are often painful; attacks one side, and then spreads over the whole body.

Hyoscyamus.—Seems very silly and laughs at everything, sometimes immoderately; head seems to fall from side to side; don't care to be dressed or covered.

Ignatia.—After fright with grief; worse after eating; relieved by lying on the back; sighing and sobbing are often characteristic.

Laurocerasus.—The child seems violent and destructive in its motions; the speech becomes indistinct when the child seems angry because not understood; it can neither stand, sit, nor lie on account of the incessant motion; gasping for breath; wasting away.

Lycopodium.—Red sand in the urine or the urine stains everything red; very feverish and fretful, particularly on waking from sleep.

Natrum mur.—Paroxysms of jumping up high; jerking of the right side and head; from a fright or the suppression of eruptions on the face.

Nux vom.—Loss of appetite and constipation, worse in the early morning; despondency.

Opium.—Convulsive movements of one or other of the arms to and fro; the left arm trembles in paroxysms; constipation of round black balls; the twitching continues during sleep.

Phosphorus.—During rapid growth, tall and rather slender; walks like one paralytic; very weak.

Secale.—The muscular twitchings usually commence in the face and spreads thence all over the body, sometimes increasing to dancing and jumping.

Sticta.— The disease seems to develop itself mostly in the feet, causing one to jump and dance around; even when lying down the feet move about in the air.

Stramonium.— The motions are rather violent and crosswise; inclination to pray and beseech; stammering speech, or loss of speech; often puts the hands to the genitals.

Sulphur.—Particularly after suppressed eruptions, as if the skin is very full of eruptions, itching very much in the warmth; faint, hungry spells.

Veratrum viride.—Unusual twitchings and contortions of the body, unaffected by sleep; a little froth constantly at the lips; chewing of the teeth during sleep; difficulty in swallowing.

Zincum.—Characterized by a fidgety condition of the feet whilst lying in bed; jerks through the whole body during sleep, sometimes with screaming.

STUTTERING.

Stuttering is a spasmodic neurosis of co-ordination, which obstructs the utterance of the syllables, by spastic contractions at the stop points for vowels and consonants in the articulating tube. This obstruction may be experienced as soon as the patient begins to speak, or it may not be encountered until later on in the middle of his remarks, although all the syllables had previously been articulated with perfect correctness. All isolated sounds are correctly articulated. In the articulation of a syllable which commences with a consonant, especially an explosive sound, or more rarely a syllable commencing with a vowel, the speech is suddenly impeded and the first sound of the syllable or the terminal sound of the preceding one. is repeated usually many times, until finally the obstruction is overcome, and the patient can continue his sentence. This spasmodic obstruction is not experienced at all times; intervals occur during which the stutterer is able to speak.

The apparatus of speech in the mouth and larynx is, as a rule normal, but very often the development of the thorax and of the respiratory muscular system is defective; stutterers never, however, possess that degree of control over the respiration which is necessary for speech. They do not inspire sufficient air, and are not sufficiently economical in its expenditure, and allow it to escape without putting it to use; they are sometimes compelled to stop in the middle of a word to draw breath. Stutterers are unable to subordinate the consonantal muscular action to the vocalic, or to graduate the two at all correctly. In the utterance of continuous sounds, the stutterer is only occasionally detained longer than is compatible with smoothness of speech, but it is when he tries to vocalize the explosive sounds that the characteristic manifestations of his infirmity becomes apparent. Stutterers do not succeed in attaining the correct rythm in speaking because they close too firmly the glottis in the formation of vowels, and the accessory consonantal tube in the formation of explosives, and are consequently unable to relax them when the proper time comes. The controlling power over the rhythmic progress of speech which the will is accustomed to exert in ordinary conversation, is however, more frequently impaired by great mental irritability and nervousness, than by any other causes. The very fear of stuttering may itself cause the impediment to show itself. Columbat distinguishes two varieties of stuttering, *labio-choreic*, and the *gutturo-*

tetanic. In the guttero-tetanic form, the closure of the glottis which is required for the utterance of a vowel is unduly prolonged and develops into a spasm of the glottis. Stutterers affected in this way may find difficulty in enunciating the vowels, even when they occur at the beginning of a syllable. In the *labio-choreic* form, utterance is arrested by the sounds, *b*. *p*, *d*, *t*, *w*, *m*, and the patient is unable to force the transition to the succeeding vowel. Stuttering is more marked in the morning than in the evening, and is aggravated by fatigue and exhaustion. Stuttering is very common in some families partly in consequence of hereditary transmission of the predisposition, partly as a result of bad example and faulty education. This disorder often appears *temporarily* at the periods of dentition and of puberty, or becomes markedly aggravated at these eras. (Kussmaul.)

Treatment.—This should be at once gymnastic, moral and didactic; the former directed against the local weakness of the respiratory organs, the moral in overcoming the lack of self confidence and of power of will, and the latter in exercising a strict supervision of the mode of using sounds and words, and the co-ordination of the functions of respiration phonation and articulation.

The remedy that the author has found most promptly effective is *Stramonium*. Teste says it constitutes the whole treatment, and should be given in the ninth dilution three times a day for weeks. See Chorea.

DEAF-MUTISM.

All deaf mutes are not necessarily perfectly deaf as the word would seem to indicate, as we find among them persons who are still able to hear and understand loud calling and speaking, that is carried on behind their backs. It is evident then that deafness is not necessary for the production of deaf-mutism, and that a high grade of hardness of hearing during childhood may prevent entirely, or to a marked extent, the development of speech. A child may be brought by its parents to the physician to have its tongue cut, because it makes no progress in speaking. They will assure him that the defective s cannot be due to any trouble with the ears because the child well. A careful examination, however, may show that althou child really hears, it does so but imperfectly, and that it belo the category of deaf-mutes. The causes of deaf-mutism differ respect from the causes of ordinary deafness, except in this, that they come into operation during intra-uterine life, or during early childhood. It is difficult to decide whether the majority of deaf-mutes come into the world deaf, or become deaf after birth. Dissections prove that imperfect development of the auditory organs, must be classed among the anatomical causes of congenital deaf-mutism. It is certain that in intra-uterine life as well as in extra-uterine life, the causes which most frequently abolish hearing, are inflammatory processes in the cavum tympani and the internal ear. Meningitis, scarlet fever, typhus, measles and otitis interna are the acute diseases that most frequently cause deaf-and-dumbness during childhood. (Kussmaul.) Modern sagacity has solved the problem of teaching deaf-mutes to produce not only signs and written characters, but also articulated words. This of course can only be attained in an institution set apart for the education of deaf-mutes.

The remedy must be directed to the cause. *Bell.*, *Calc. phos.*, *Lyc.*, *Sepia*, etc., may be indicated.

SPINAL MENINGITIS AND MYELITIS.

The diseases of the spinal marrow are still in a state of obscurity, and all that is positively known of them could be stated in a few lines, if they could be confined to the distinctly demonstrated anatomo-pathological alterations. First of all, as regards the much abused hyperæmia, all post-mortem appearances must be excluded as spurious where the cadaver was not placed upon the face immediately after death, and the autopsy was performed later than twenty-four hours after life terminated. Without this precaution there will be found in every case, even in the most normal, extensive post-mortem hypostasis, imbibition of the coloring matter of the blood, and putrid softening, by which it becomes totally impossible to establish the previous existence of any actual disease in the medulla spinalis. Although the anatomo-pathological condition is different in kind, still inflammation of the spinal cord and its membranes may be comprised in one group of symptoms, for the phenomena in both processes are almost identical, and hence a differential diagnosis becomes extremely problematical.

Pathological Anatomy.—In young children the cerebral arachnoid and pia mater, and the veins within the spinal canal are always plethoric; in fact the vessels are so full that, even when the precaution is taken of turning the body upon its face immediately after death, extravasations are not unfrequent occurrence. It is not always easy to determine whether the blood found external to the dura mater was extravasated during life, or whether the blood was poured out upon the dura mater, from veins that have been severed during the removal of the vertebral laminæ. The best means of guarding against an error is not to attempt the removal of very long sections of the vertebral laminæ at one time, but to remove small portions, at different places, and then allow a feeble stream of water to play upon the exposed dura mater. The blood exuded from the veins after death is entirely washed away in this manner, while that extravasated during life, is always somewhat coagulated, and adheres somewhat firmly to the dura mater. These hæmorrhages are most frequently found in the cervical and lumbar regions, sometimes extending but a short distance, or lining the spinal canal forming a complete sheath of coagulated blood. The same kind of hæmorrhages which occur externally to the dura mater, are also met with in the sac between the dura mater and arachnoid, or the latter and pia mater. Here also the amount of the extravasation varies between a pin's head and such a quantity that the cord is surrounded by blood. As the dura mater has no large veins to be severed, there is less opportunity for error as to the source of the hæmorrhage. In the loose cellular tissue between the dura mater and the bony spinal canal, some serum is always found, even in the normal condition; it may, however, be considerably augmented, and, like a gelatinous mass, cover large regions of the dura mater. In older children, after injuries to the spine, or in spondylitis, a visible opacity and thickening of this membrane are also found, along with a deposit of plastic fibrinous character. In all children a moderate quantity of spinal fluid is found on opening *into* the dura mater, which normally is of a pale yellow color and perfectly clear, but which in affections of the arachnoid and pia mater, become opaque, flocculent and bloody. The fluid exudations are always found in the most dependent part, according to the position of the body. In rare instances, a fibrinous deposit is found upon the dura mater conjointly with the flocculent cerebro-spinal fluid, which lik the purulent meningitis within the cranium, may become of a pu lent nature. Usually the spinal cord itself in these morbid alterati of its membranes, is softened and eroded, so that it is difficult examining the spinal cord of a child, to diagnosticate a softening sclerosis merely by the resistance which a scalpel meets, for the spinal cord, in general, is so soft that the slightest force will divide it. Where these morbid changes have taken place, red softening is as a rule observed in some part of the cord itself. (Vogel.)

Symptomatology.—In young children the diagnosis is difficult, for all that may be noticed will be a slight tetanic stiffening of the limbs, succeeded by irregular jerkings, a small thread like pulse, scanty and superficial respirations, and a painful whimpering when they are moved. Older children complain according as the inflammation has its seat in the upper or lower segments of the spinal marrow, or in its whole extent, of stinging pain in the attacked region, which will be increased by movements. Stiffness of the limbs, of the muscles of the neck, trismus, great sensitiveness, tonic muscle cramp of the trunk and of the extremities, amounting even to perfect tetanus, involuntary passage of urine and fæces, suspended respiration, small, quick pulse, and a somewhat increased temperature, with subsequent cyanosis, paresis, and acute paralysis of the upper and lower extremities, form the symptom complex. This may be more or less influenced according to the seat and extent of the inflammation, and by the simultaneous presence of meningitis, (cerebral.) Spinal meningitis takes in children generally a rapid course, and its whole extent may not occupy more than two or three days, especially in the new-born, resulting in abundant purulent exudation; in more advanced children it may last for two or three weeks. (Steiner.)

Prognosis.—When the disease can be recognized, an unfavorable prognosis may generally be given.

Treatment.—The remedies already given under simple meningitis, cerebro-spinal meningitis and tetanus will be frequently indicated here also, particularly *Bell.*, *Aconite*, *Gels.*, *Cuprum*, *Opium*, *Rhus*, *Stram.*, *Caust.*, *Bry.*, *Cicuta*, *Conium*, and *Verat. vir.*

DISEASES OF THE SKIN.

ERYTHEMA.

The skin of a new-born infant, it will be remembered, undergoes a genuine hyperæmia.

The rush of blood to the surface is necessary to the rapid development of the epithelium. If not properly handled, if irritated or kept too warm, this hyperæmia may pass over to inflammation—the so-called *red-gum* or dropulus. The yellow stain is due to the pigment remaining after the blood leaves the surface.

Erythema neonatorum is a physiological reddening of the skin, which is seen after birth, especially strongly marked in some children, and which passes off into a yellow shade, and disappears in a few days. *Erythema papulatum* is a form also seen in new-born children, consisting of dark red prominent nodules of pin point size, scattered over the skin and surrounded by small rings of a fainter red color. It is liable to be confounded with measles, but may be distinguished by the absence of fever and the catarrhal symptoms which accompany measles. *Erythema intertrigo* is a variety due to some mechanical or chemical irritation, and is most frequently developed at those places where two folds of skin are in contact especially at the genitals, and the folds of the joints, being due to a superfluity of fat, tenderness of the skin and its irritation by the urine and excremental matter. If neglected it may result in abrasions superficial or deep ulcerations, and may even take on aphthous or diphtheritic membrane, or become gangrenous. An erythema of the malleoli and heels may result from the application of the same irritant matters, or from incessant rubbing together in the to and fro movements of the heels on the wrappings. (Bouchut.)

Treatment.—This consists in preventing the rubbing and contact of the surfaces by means of powdered starch; when ulceration has taken place this substance become moistened, form a mass and increase the inflammation. Sweet oil may then be advantageously employed, or *Petroleum* spread upon lint, and kept in place by a bandage. The remedies indicated are either *Aconite* or *Sulphur*.

FURUNCULOSIS.

Children of various ages frequently suffer solitary furuncles or boils, which corresponding with the more rapid metamorphosis of the tissues generally, comparatively quickly cast off their "core" and heal up. But in children the progeny of tuberculous parents, the case is totally different. In the latter, large numbers of furuncles occasionally occur on the occiput and over the entire head, come on one after the other, break, and cause the child great suffering for a long time. Usually no firm "core" is expelled, as in the simple phlegmons, the contents consisting of thick, yellowish or bloody pus, which often becomes agglutinated with the surrounding hairs into thick flat crusts. Coincident swelling of the glands of the nape of the neck occurs; they are very painful to the touch, and, in fact, now and then suppurate. These furuncles may become so numerous that the whole occiput is covered with a mass of confluent crusts, under which new ones constantly appear, elevate the old crusts, and by the discharge of their contents, assist in thickening it; this is protracted for many weeks. Young children hardly sleep at all, but older ones, when the nurse takes them upon her arms, where they are able to lay their face upon her shoulder, are able to sleep. Finally the crusts dry up, and no accessions follow; the scabs become loose and may be removed, together with the hair, or what there is left of it, and the swelling of the cervical glands disappears.

In perfectly healthy children this disease is scarcely ever observed; but ordinarily it is the harbinger of a long list of scrofulous affections. (Vogel.) In other words derangement of the superficial lymphatic system.

Treatment.—Locally, the crusts are best treated with some oleaginous substance. *Petroleum* or simple cerate should be applied daily until the crusts soften and fall off. No relief is obtained by prematurely opening the boils; it is best to wait until they have matured, before puncturing. The remedies that are usually indicated are: *Hepar*, *Silicea*, *Calc. phos.*, *Bell.*, *Iod.*, *Ars.*, *Calc. iod.*, *Natr. carb.*, *Carbo veg.*, *Phytolacca.* (See Cervical Adenitis.)

ERYSIPELAS.

This disease is an inflammation of the skin, with cellular infiltration of the corium and subcutaneous tissue. It is as often seen in newborn infants as in grown children. *Erysipelas neonatorum* generally makes its appearance first at the umbilicus though sometimes elsewhere, as on the penis in ritual circumcision, and is ushered in by febrile symptoms, and redness of the skin, swelling and tenderness. If the inflammation spreads the general symptoms increase in severity, the temperature rising, and the child suffering from great restlessness, nervous derangement and even convulsions. Sometimes the disease spreads outwards while it leaves the skin first affected, or it may break out in distant parts. Occasionally the inflammation takes on a phlegmonous character, and ends in suppuration, this occurring most frequently on the sacrum and back of the hands and feet; and on the scrotum the inflammatory action may even become gangrenous. It is always a disease of dangerous character, and is apt to be complicated by, or lead to such lesions as purulent peritonitis, meningitis or general pyæmia. (Vogel.)

Treatment.—The remedies chiefly indicated are: *Bell.*, *Rhus*, *Ars.*, *Apis*, and the local use of dilute *Glycerine.*

ECZEMA CAPITIS. ECZEMA FACIEI. CRUSTA LACTEA. MILK CRUST.

This affection is often met with in infants at the breast during the first dentition, and at later periods of childhood. When mild, it consists of an eruption of numerous small vesicles or sero-pustules, spread over certain portions of the scalp to which it may be limited, or it may attack the forehead, temples, or cheeks. In these cases it is attended with slight redness and heat of the integument; the sero-pustules discharge their fluid contents, these form thin crusts, and gradually fall off, leaving slightly reddened or excoriated surfaces. In severer cases there is great heat and itching of the scalp, which is inflamed, red, swollen, tense and painful. The eruption is more completely pustular, and as the pustules open or are torn by the uncontrollable scratching, they discharge an abundant thin sero-pus, o even a thick and viscid fluid, which glues the hairs together, an hardens into uneven brownish-yellow crusts. If the scalp is not kep clean by constant washing or emollient applications, the crusts increase rapidly in thickness, by successive discharges of fluid from pustular surface beneath, until at length the whole of the diseased part is covered with thick, heavy, rough and adherent crusts, of a brownish or yellowish-white color, or at times of a positive black, from the admixture of blood which oozes from the inflamed surface, torn by the nails of the little sufferer. When neglected, the crusts become more and more thick, and from the heat of the head and exposure to the air, they undergo partial decomposition and exhale a very offensive odor. Among the children of the poor and destitute, lice often form in abundance. At first, the crusts are soft from the percolation of the fluid exuded beneath, but as they become more abundant and thicker, their outer surface becomes dry and sometimes friable. The secretion from the inflamed surfaces, often makes its way from under the crusted mass, and flowing down over the forehead and behind the ears, irritates the parts that were before healthy and thus extends the disease. When the crusts are removed by any means, the surface of eruption is found to be red, shining, wet, and discharging purulent or sero-purulent fluid. The scalp is tumefied, tender and abscesses may form beneath it. The lymphatic glands, as the occipital, submental, or cervical enlarge, and at times suppurate. The tendency of the disease is to assume a chronic form. When it attacks the face, it begins by the appearance of minute vesicles or sero pustules on a patch of reddened and slightly swollen skin ; there is also an excessive pruritis. If the eruption is scanty, rather vesicular, and the degree of inflammation slight, the cuticle breaks and there is discharged a thin, turbid fluid which dries into delicate flakes. In a more severe form there is pustulation, the formation of yellowish, brownish or brownish-red crusts, broken by cracks and fissures, while in extent it may cover the face like a mask. The heat and tension, the itching, etc., occasion much restlessness irritability, and makes the child cross, and peevish and with loss of sleep debilitate the sufferer. (Meigs & Pepper.)

Treatment.—The chief remedies are: *Graphites*, *Staph.*, *Hepar*, *Rhus*, *Oleander*, *Viola tri.*, *Calc. carb.*, *Sil.* Locally, *Cod Liver Oil*, *Boracic acid* and *Petroleum*, are frequently recommended, but the less the surface is irritated, the better. Where the food is sweet, or hard to digest, more nourishing diet should be directed. See Foods, also Kippax on Diseases of the Skin.

VARICELLA. CHICKEN POX. WATER POX. SWINE POX. STONE POX.

Chicken pox is an epidemic and contagious disease, characterized by the presence on the skin of vesicles, more or less numerous, filled with a colorless and limpid fluid. It is not to be confounded with varioloid, as it is a vesicular disease only.

Chicken pox is preceded by a slight fever which lasts from twelve to forty-eight hours at most. The febrile state is often scarcely to be appreciated, and does not prevent the children following their usual games. In some rare instances the invasion is preceded by abdominal pains, vomitings, etc. Chicken pox is either discrete or confluent. It is characterized by small, red, slightly prominent spots, circular when they are isolated, irregular on the contrary when many are observed on the same spot. On the next day a prominent vesicle filled with colorless or pale yellow, perfectly limpid fluid, which readily escapes when the vesicle is pricked, is formed in the centre of most of these elevations. On the second day this vesicle is about one line and a half in diameter, and either projects to a point or assumes a rounded form. On the third day the color of the lymph is yellowish, but this is the only change which the vesicles have undergone. On the fourth day, those which have not been accidentally broken, diminish in size, and become shrivelled at the circumference. The fifth day, a small crust adherent to the skin, is formed at their centre, and a small quantity of opaque lymph is enclosed in their circumference which sometimes gives them an appearance of central depression. On the sixth day, small yellowish or brown crusts occupy the place of the vesicles. On the seventh and the eighth, the crusts become detached and leave small red spots without depression on the skin, which remain for several days.

During the course of the eruption, many of the elevations appear to become abortive; some remain in the state of simple spots, or of papular elevations, and become gradually effaced; the others are only surmounted by a very small vesicle which is easily broken, or vanishes very quickly. (Rayer). Usually it is not complete
eruption but in a succession of crops.

The vesicles of chicken pox are not always, however, pre
a red spot on the skin; they are then true bullæ which beco
oped without a precursory local symptom. Discrete chicke

always a slight disease which scarcely affects the health of the children. When confluent it is accompanied by more or less intense fever, which does not fail to diminish as the eruption disappears. The duration of chicken pox is from eight to fifteen days at most, and it only leaves behind slight traces on the surface of the skin. It may be mistaken for pemphigus.

Treatment.—If it occurs during dentition, *Bell.*, *Cham.*, *Coffea*, or *Hepar* may be used. If uncomplicated *Puls.* will usually be all that will be required. It is also recommended as a prophylactic. If the fever is high *Aconite;* if there is œdema and itching *Apis.* If pustulation occurs from injury, *Tart. emet.*

MORBILLI. MEASLES.

Measles are an epidemic and contagious exanthema, characterized by catarrhal symptoms, continued fever, and an eruption, generally on the fourth day, of a crimson rash, in the form of stigmatized dots, like flea-bites, slightly elevated, which coalesce into irregular circles or crescents, and end about the seventh day by desquamation. Measles are a more common, though a less fatal disease, and attack a larger number of persons than scarlet fever. The frequency of the disease is very irregular in different years because of its epidemic nature.

Etiology.—A chief cause of the disease is epidemic influence, and its contagious nature is universally admitted. The precise period at which measles is capable of producing infection in another person is uncertain, and the exact time when the subject of it ceases to produce contagion is not known. The disease may be carried in fomites. It has been propagated by inoculation with the blood taken from a patient, and with serum obtained from the vesicles which sometimes accompany the eruption. The period of incubation is very difficult to determine, owing to the uncertainty as to the date when the disease becomes contagious, but is usually stated as from five or six days to twenty days or even longer. In the great majority of cases, however, the eruption appears in from twelve to fifteen days after exposure to the contagion, thus making the duration of the period of incubation from nine to twelve days. According to Rilliet and Barthez, measles are more frequent, less contagious, and have longer incubative and prodromic stages than scarlet fever. (Meigs & Pepper).

Symptomatology. — *The Prodromal Stage.*— In robust children and mild epidemics, this period is not so violent as to cause the children to take to their bed, or to present any signs of a serious disease. The most common difficulties are: Catarrh of the nose and sneezing, with consecutive swelling of the nasal mucous membrane, reddened conjunctivæ, lachrymation, slight blepharitis, intolerance of light, hoarseness and a dry, barking cough. The cough infrequent and slight at first, becomes more troublesome as the case progresses, until it assumes on the third or fourth day a character which is peculiar, and which may often lead to a suspicion of the true nature of the attack. Vomiting occurs sometimes, but not as a general rule. In some instances there is diarrhœa. Sometimes soreness of the throat is complained of, but the faucial affection is not severe enough to elicit much complaint, and does not produce difficulty of deglutition. It consists generally only of slight redness of the tonsils, soft palate and pharynx, and is most strongly marked about the time that the eruption makes its appearance. There may be some glandular enlargement behind the jaw, or even of the cervical lymphatics. The tongue is usually white and somewhat furred, sometimes pasty, and pressure upon the stomach painful. (Vogel). At the same time the skin becomes warm and dry, the face is generaly flushed, and there is considerable restlessness and irritability at first, often passing into quiet and drowsiness as the eruptive point approaches. The fever is accompanied by thirst, partial or complete anorexia, and generally by headache, which is frontal and often complained of by children old enough to give an account of themselves. With regard to the drowsiness, the child if undisturbed, sleeps quietly for many hours, or for the greater part of one or two days, waking only from time to time to take a drink, and then sinking off to sleep again. This symptom is not alarming, unless it be connected with others which indicate local disease, or unless it pass into coma, or alternate with marked delirium. Other nervous symptoms which sometimes occur, especially when the fever is violent, are restlessness, irritability, occasionally delirium at night, and, in very rare cases convulsions.

The duration of the initial stage is from three to four days
the *fourth* day, although it may last longer. (Meigs & Peppe

Stage of Eruption.—Generally on the fourth day from t
mencement of the disease, the characteristic rash appears.

seen on the forehead close to the scalp, it from thence rapidly spreads to the rest of the face then to the trunk, lastly to the extremities, in the accomplishment of which it occupies in some cases but a few hours, but more commonly three days. On the first day chiefly limited to the face, it increases greatly in quantity over the trunk on the second and is most abundant on the extremities on the third day of the eruption. The eruption is made up of a number of minute, deep red circular stigmata not unlike flea bites, slightly elevated, and though close together, yet usually distinct from each other, the skin in the spaces between them retaining its natural color. On the cheeks, the spots sometimes become confluent, and then form irregular blotches about a third of an inch long, by half that breadth, while the spots elsewhere often present an indistinctly crescentic arrangement. Should the eruption be very intense, the surface and redness of the patches are quite uniform, but mostly in the redness numerous small papillæ can be seen, and even in the former case, on the decline of the eruption, the papillæ become visible. Mostly abundant on the face, the quantity of the eruption developed becomes less the lower we descend, and the eruption is often only thinly scattered on the furthest extremities of the body. In rare instances, if the eruption be intense, small, clear, acuminate vesicles may be developed at the summit of the papillæ. The fever does not diminish when the eruption makes its appearance, and it sometimes augments; the irritation of the eyes continues, and lachrymation and injection of the conjunctiva become more marked. There is slight swelling of the whole surface of the body (if the eruption be abundant and general); this is especially noticeable in the face, and causes a variable amount of alteration of the features. The nostrils are either dry and incrusted, or there is coryza, and in some cases epistaxis. The tongue is covered with a yellowish or whitish fur in its middle while the edges and tip are clean and red. It remains soft and moist unless some complication occurs. The tonsils, soft palate and pharynx are considerably reddened, but not tumefied. The feet and hands feel full and tense; deafness may be present, being due to the swelling of the mucous membrane of the Eustachian tube. The elevation of temperature or fever, varies greatly in degree. The highest temperature reached in ordinary cases is usually 103° F. If the temperature rises above this, it indicates a severe, if it continues below this, a mild attack. The urine is scanty, and on cooling deposits an abundance of lithates, and during the fever, has a peculiar yellow color. Albumen in small quantities is sometimes present.

Stage of Decline.—The disease having reached its height in the course of the sixth day of the attack, the second day of the eruption, it remains stationary for one or two days longer, and then begins to subside. The eruption fades in the same order as that in which it appeared, and on the eight or at least the ninth day it has entirely vanished, leaving behind either a little general redness of the surface, or a few yellowish-red spots, corresponding to some of the situations which the eruption itself had occupied. These stains at length disappear altogether. As the eruption disappears, a slight furfuraceous desquamation takes place in a considerable number of cases, but not in all the epidermis separating in minute branny scales. This begins usually about the face, and may either be limited to that part, or extend to other portions of the body. It is seldom general, however.

The other symptoms decline with the eruption, the pulse loses its frequency, the fever diminishes greatly, the catarrhal symptoms subside, cough is less frequent and loses its hoarse tone, expectoration is more copious, the tongue cleans off, thirst ceases, the appetite returns and complete recovery takes place. The period elapsing before perfect health is restored varies greatly, according as the patient is naturally robust, or is the subject of tuberculosis, scrofulosis, or syphilis. (Ringer. West).

Morbilli Graviores. Malignant Measles. Black Measles.—This form appears to have been far more common formerly than at present, still, cases now and again present themselves. Due either to individual peculiarity, or more commonly to a depraved state of health, or to epidemic causes, it may begin mildly, or the symptoms may be at once violent and severe. Usually the rash is but imperfectly developed, and partial in its distribution, or of a livid, purplish, or even black color, apt to disappear and again appear. There are marked prostration, great tremulousness, twitching of the muscles, delirium low and muttering in character, stupor or partial coma. The lips and teeth are covered with sordes, the tongue becomes dry and brown, the pulse is rapid and feeble, the respirations are hurried, and often the symptoms of congestion of the lungs are present. The extremities are cold, and petechial spots appear on various parts of the body. The urine may contain blood, and bloody effusions found in the various cavities and organs of the body. Death us occurs early; should the patient rally, convalescence is much longed, and death not unfrequently results from diarrhœa, bronc or other, of the sequlæ. (Ringer). If this form of the eruption its commencement petechial, it is not an unfavorable sign; but if it subsequently become so, if the eruption change from wine red to black, in form of round spots, extensive patches, or in streaks, then it is of almost fatal significance. (Veit).

Modifications, Complications, and Sequelæ.—The eruption is the *distinguishing* feature of measles, but the catarrhal affection is, in every way, the most important. Indeed the eruption may, and sometimes does, happen without the fever and the catarrh; and nosologists, recognize a variety of the disorder under the title of *morbilli sine catarrho.* But it is observed of this variety, that it confers no protection whatever against the recurrence of the malady, and may be succeeded in a few days by an attack of measles in its regular and complete form. It also happens that measles, which at first appeared as synochal, alter their character entirely, in the course of a few days, to that of the putrid variety.

The complications and sequelæ are either the anatomical lesions, so increased in severity, or continued after the fever has declined, as to become of serious importance; or intercurrent diseases not usually attendant on measles. Very serious in nature, and often of great severity, they not infrequently terminate in death. Dangerous complications of measles seldom present themselves on the side of the nervous system, but more frequently occur in the respiratory organs. The cough, hoarseness and suppressed voice which accompany the onset of measles, are sometimes so marked as to raise the apprehension that croup is about to set in, and now and then this actually occurs, but this threatening symptom usually subsides. Chronic inflammation of the larynx is commonly met with, and generally proves obstinate, disappearing only to return again, on slight exposure to cold. The voice and cough are hoarse, and sometimes at the same time there is deafness in one or both ears. When the latter occurs, the tonsils are also enlarged.

Chronic inflammation of the bronchial tubes may also follow measles. The cough is hollow, ringing, hacking or sometimes paroxysmal, and is easily aggravated by exposure to cold. With or without expectoration, but accompanied usually by some oppression of breathing, it may continue with remissions, or for a time disappear, but easily returns upon exposure. Capillary bronchitis may occur either during or subsequent to the decline of the fever. It is almost always fatal in young children under two years of age. Pneumonia, both simple and lobular, occurs both as a complication or as one of the sequelæ. Another sequel of measles is tuberculosis. Sometimes it develops very rapidly and intensely as miliary tuberculosis, so that the patients never recover enough to leave the bed, but continue to suffer from fever and to cough and emaciate from the time the exanthema disappeared. Generally, however, a lengthy interval is observed between the disappearance of the eruption and the first appearance of the tuberculous symptoms. These children get up again, are free from fever, have a good appetite and the measles is forgotten. A slight bronchitis, however, has remained, and persists in defiance of the best nursing, uniform temperature, etc. Very gradually, aggravations are noticed, towards evening, followed by general indisposition, loss of spirits and strength, and with this the cough increases in severity. The emaciation becomes more and more marked, the tuberculous phenomena are soon physically demonstrable and in most instances rapidly advance to a fatal termination. Should this be arrested, the child will for years be prone to bronchitis, and experience new tuberculous attacks. Otorrhœa is another consecutive disease, and in most instances is complicated with tuberculosis. Impetigo and eczema of the face, and of the scalp, especially behind the ears are very common sequelæ. Chronic inflammation of the eyes (conjunctivitis, blepharitis) is far from uncommon, especially in scrofulous children. Intestinal catarrhs likewise occur, with erythematous, and follicular entero-colitis. In badly nourished, cachectic children, noma also occasionally supervenes. (Watson. West. Vogel).

Diagnosis.—Measles may be confounded with scarlatina and erythema. Very many new-born children, and infants a few weeks old, are attacked by a fine punctated erythema, diffused all over the body which differs in no respect from the eruption of measles. This is most probably, produced by mechanical causes; the delicate cuticle not yet sufficiently accustomed to the contact of the air, baths, and clothing, becomes irritated, and its papillæ inflamed and enlarged. This exanthema in most cases lasts for several days, vanishes, returns occasionally, but ordinarily is not complicated with catarrhal symptoms. If these accidentally happen to be present, the whole affection will not run such an exact rhythmical course, and is not ushered in by such violent fever as ushers in measles. At the same ti should be recollected that new-born children are far less susce to the contagion of morbilli than older ones, and usually escap disease, although it may be in the same house with them. (Vog

Therapeutics.—Jahr considers *Pulsatilla* to be the chief remedy; *Aconite* for the febrile state, and *Bryonia* or *Sulphur* where the eruption fails to make its appearance. In suppression of the exanthem and when the extremities are cold, the patient very weak and the pulse small and intermittent, *Veratrum alb.* and sometimes *Ars.*, *Carbo veg.* and *Phos.* are indicated. Hering recommends *Camphor* for the same condition. If the appearance of the eruption is delayed and vomiting sets in, *Antimonium crud.* often favors its development; so does *Ipecac* if dyspnœa prevails. If the eruption is fairly out, and *Aconite* does not moderate the fever, the remedy in such cases is *Sulph.*

Aconite.—At the beginning, full, quick pulse; dry, hot, burning skin; fever; restlessness; catarrhal irritation from the eyes down into the bronchial tubes; nosebleed, drv, hacking, even croupy cough; stitch pains in the chest; restless sleep, with jerking and starting; grating of teeth; moaning and groaning, or sleeplessness, with great agitation and anxiety; pain in stomach and bowels, with vomiting and diarrhœa. Valuable when croup complicates.

Antimonium crud.—Gastric derangement; white coated tongue; pain in ears.

Apis.—Confluent eruption and œdematous swelling of the skin; greatly inflamed eyes; croupy cough; violent cough, similar to whooping cough; catarrh of the bowels, with diarrhœa; prostration, muttering, and diarrhœa.

Arsenicum.—Black measles, or retrocession of the eruption; sallow complexion, with blue or greenish-brown stripes; crusts around the mouth; bloated face, pale and red; burning-beating pains in the eyes, with photophobia; typhoid symptoms; vomiting; diarrhœa; great sinking of strength; all worse about midnight.

Belladonna.—At the commencement: heat, with moisture in the skin; quick but soft pulse; constant drowsy sleep, or drowsiness, with inability to go to sleep; congestion to head; injected eyes; thick white coated tongue; sore throat, with difficult deglutition; hoarseness and dry cough, which fatigues the chest, with oppression and suffocative fits; convulsive twitching of the limbs; convulsions; violent thirst.

Bryonia.—Slowly forthcoming eruption, which remains pale; inflammatory affections of the chest; dry painful cough; rheumatic pains in limbs; constipation.

Camphora.—In those dangerous cases where the face grows pale and the skin cold, assuming a bluish-purple color, with utter prostration and spasmodic stiffness of the body; also in sequelæ, especially painful and difficult micturition.

Carbo veg.—Persistent hoarseness after measles.

Cuprum.—Repercussion of eruption, with convulsions, vomiting and gagging; pale face and twitching of limbs.

Drosera.—Cough, with drawing together of the epigastrium, similar to whooping cough; cough, as a sequela of measles in paroxysms, worse in the afternoon and evening; sometimes attended with bloody and purulent expectoration.

Dulcamara.—Retrocession of eruption, from exposure to damp cold air.

Euphrasia.—Streaming of hot burning tears from eyes, with great photophobia; profuse running from nose without burning; cough only during the day.

Gelsemium.—Eruptive stage: chilliness; watery discharge from nose; hoarseness, with feeling of soreness in throat and chest; rawness of chest, with cough; retroceding measles, with livid spots; dulness of brain; abdominal and thoracic congestion; fever heat, with drowsiness.

Hepar.—Croupy cough, with rattling in chest, but without expectoration; worse mornings.

Ipecacuanha.—Tardy appearance of eruption, with oppression of chest, tickling cough, and vomiting; short hurried breathing.

Kali bich.—Flowing of water from the eyes, with burning when opening them; pustules on the cornea; stitches in the left ear, extending into neck and head; watery discharges from the nose, with great sensitiveness and ulceration of the nostrils; loud rattling cough, with stringy expectoration.

Mercurius.—The glands of the throat are much swollen, with difficulty of swallowing; slimy stools, streaked with blood.

Phosphorus.—Violent and very exhausting cough; dry cough, with desire to vomit or vomiting; typhoid symptoms, with loss of consciousness; watery diarrhœa; tongue coated with dirty thick mucus; black lips; debility; typhoid bronchitis.

Pulsatilla.—Conjunctivitis, with photophobia and lachrymation; inflammation of the inner and outer ear, with or without discharge: yellowish, slightly acrid discharge from nose; high fever, w thirst; loose rattling cough, with expectoration of thick mucus; nightly diarrhœa preceded by rumbling in bowels; aggravations; chronic loose cough after measles.

Sticta pulmonaria.—Incessant dry and spasmodic cough, worse in the evening and during the night, with oppression of the chest, and a feeling as if a hard mass were collecting in the lungs; feeling of fulness and heavy pressure at the root of the nose, with tingling; conjunctivitis, with profuse, but mild discharge; sleeplessness.

Stramonium.—Sometimes before the outbreak of the eruption, frightful visions, like those of delirium tremens, at which he is startled, and from which he tries to hide; spasmodic affection of œsophagus, hindering swallowing.

Sulphur.—Either during the first stage when the eruption makes a tardy progress, or for after-complaints, such as chronic coughs, originating in remnants of partial pneumonia; chronic diarrhœa; hardness of hearing; chronic discharge from ears.

Veratrum alb.—Pale livid color and tardy appearance of the eruption; hæmorrhages, without amelioration; burning heat, with alternate cold extremities; very frequent, weak, intermitting pulse; delirium, restlessness; drowsiness; apathy.

ROTHELN. RUBEOLA NOTHA. GERMAN MEASLES. FRENCH MEASLES. ROSALIS.

An exanthematous disorder, intermediate in character between, or composite of scarlet fever and measles. Apparently more common on the continent of Europe, this affection has not been much noticed in Great Britain, and has been scarcely described until within a few years in the United States. Yet there is reason to believe that it has long, if not always, been tolerably frequent; its resemblance to both measles and scarlatina, has usually assigned it to one or other of those diseases. Opinions differ as to the nature of this affection, whether it is a specific disorder, or a *hybrid* of measles and scarlet fever, the former is probably correct, as the disease confers no immunity against either scarlet fever or measles. In the absence of any record of fatal cases, the morbid anatomy of the affection can only be conjectured; its true pathology is therefore undetermined.

Symptomatology.—The early symptoms are generally mild; malaise, headache, slight sore throat, loss of appetite and debility. The eruption appears on the second or third day, at first resembling that of measles, but becoming soon more like that of scarlatina. and with some increase of fever. At the same time it is dotted or miliary (subpapular) in form. It may be almost continuous, with a moderate amount of tumefaction of the limbs and general surface. Coryza and angina may both be present, and there is subsequent desquamation. The glands of the neck may be swollen. Albuminuria and dropsy occasionally follow this disorder, as well as chronic bronchitis. The temperature does not often exceed 100° F.

Diagnosis.—The abruptness of the appearance of the eruption is quite diagnostic. Sometimes after about three days of indisposition, a rash breaks out which is miliary in form, but of a nearly scarlet hue, attended with slight sore throat, with or without a disposition to cough, and moderate fever, all of which symptoms subside in a week, leaving no sequelæ, and especially when a number of such cases occur in the same neighborhood, exhibiting the same absence of severe character, and all followed by rapid convalesence, it may be safely concluded that it is rotheln.

Appended is the differentiation between rotheln, measles and scarlet fever.

Rotheln.	*Measles.*
Scarcely any precursory stage, the eruption ushers in the disease.	Preliminary symptoms. Fever and catarrhal symptoms.
Eruption on the first day and generally spreads rapidly all over.	Eruption on the fourth day, spreads from the face all over in about forty-eight hours.
Eruption closely resembles measles. In some cases more general efflorescence; fades rapidly; all gone by the second or third day; little or no desquamation.	Eruption crescentic, with intervening healthy skin, lasts about five days, followed by desquamation.
Catarrhal symptoms rarely present and quickly disappear.	Catarrhal symptoms characteristic.
Bronchial symptoms especially absent.	Bronchial symptoms always present.
No sequelæ.	Generally sequelæ.

An attack of measles does not protect from an attack of rotheln and *vice versa*.

Rotheln.	*Scarlatina.*
No precursory symptoms.	Precursory symptoms severe.
Eruption on the first day on the face and spreads rapidly over the body.	Eruption on the second day, first on neck and chest.
Eruption rarely confluent, discrete, crescentic, papular; gone by the second day, followed by no desquamation.	Eruption efflorescent, uniform desquamation after the seventh day.
Rarely sore throat or bronchitis, some coryza.	Sore throat, rarely coryza or bronchitis.
Tongue white with red edges.	Red "raspberry" tongue.
No sequelæ.	Sequelæ.

An attack of scarlatina does not protect from an attack of rotheln and *vive versa*. (T. C. D. in *U. S. M. & S. J.*, Oct., 1871.)

Measles.	*Scarlatina.*
Rash appears on the fourth day.	Rash appears on the second day.
Begins near roots of the hairs in spots slightly elevated.	Begins on neck and face.
Color brownish-red.	Color rose-red or crimson.
Crescentic arrangement, with normal skin between redness.	Punctiform, almost uniform.
Slight branny desquamation.	Copious desquamation.
Accompanying symptoms, coryza and cough, heat of skin moderate.	Accompanying symptoms, sore throat, strawberry tongue, great heat of skin rapid pulse.

Variola.	*Varioloid.*	*Varicella.*
Rash on third day.	Rash on second or third day.	Rash on first or second day.
First on forehead.	First on wrists.	First on back.
Shotty papules going on to umbilicated vesicles and then to pustules, with much inflammation around; often confluent.	Shotty papules, soon becoming vesicles only, others pustular, but pustules small and not confluent.	Papules, some not advancing, others vesicular, a few pustular, without umbilication; eruption irregular in progress.
Thick scabbing and scars left.	Scabs seldom leaving scars.	Usually no scars.
Accompanying symptoms, pain in back. vomiting and fever; secondary fever.	Symptoms as in variola, but milder at first; no secondary fever.	Constitutional symptoms insignificant.

Hillier (*l. c.*, 209).

Therapeutics.—The rapidity of the onset would suggest *Belladonna. Bryonia*, *Aconite*, or *Puls.*, may be needed. Compare measles and scarlet fever.

SCARLATINA. SCARLET FEVER.

Scarlet fever is an epidemic and contagious exanthem, characterized by continued fever; by a scarlet rash, which, appearing on the first or second day of the disease, ends usually about the sixth or seventh or in rare cases as late as the tenth, and is followed by desquamation and by simultaneous inflammation of the tonsils, and of the mucous membrane of the mouth and pharynx. Ordinarily it attacks a person but once in a life time. The frequency of the disease is exceedingly variable in different years, owing to its epidemic nature. The forms of the disease generally enumerated are the *simple*, *anginose* and *malignant*.

Etiology.—It has been abundantly proved that scarlet fever is propagated by two causes, *contagion*, and *epidemic* influence. The contagious material may be taken up by clothes and retained by them for a great length of time. The contagium is as yet unknown, and though Bullier describes a micrococcus as existing in the blood of patients suffering from scarlet fever, yet it cannot be regarded as the cause of the disease or its infection-carrier, but is much more likely to be the result of fermentative or catalytic action in the tissues. The majority of cases exist in children over two years of age, sucklings being seldom affected. The question often arises: When does a person who has recovered from an attack of the disease, cease to be contagious? To speak strictly, not until those natural fomities, the epithelial scales, which were existing at the time of the fever, have been removed; or what is nearly the same, not until desquamation has ceased. And in the fact that, under ordinary circumstances, these epithelial scales are all but permanently contagious, we have an explanation of the tenacity with which danger clings to materials of any but the closest texture. Uncovering a scarlet fever patient in the direct rays of the sun, a cloud of white dust may be seen to rise from the body; contagious dust, which no doubt, subsides into every crevice near the bed. The distance at which the disease may be communicated is commonly said to be not more than a few feet, yet considering the slight volatility of the poison, one is quite prepared to admit the possibility of what is said to have occurred, namely of the contagion having been conveyed hundreds of miles by letter, or similar means. The contagion clings long to rooms and houses; sometimes for many months. On the other hand, it is only necessary to look over the results afforded by tables of mortality, to observe that in some years the disease causes a heavy mortality, and in others a very small one, to be convinced that it is of a highly epidemic nature. The period of incubation is shorter than in other contagious eruptive diseases, and may be stated to vary between twenty-four hours and two or three weeks.

Symptomatology.—Ordinary or typical scarlet fever. The stage of invasion or prodromic stage. This precedes the eruption from twelve to thirty hours, and is marked by feverish symptoms, shivering alternating with heat, a pulse of 160, and temperature 104.3°, headache, sickness, and vomiting of bilious looking matter, occasionally epi
pain on swallowing and redness of the tonsils and fauces; res
in proportion to pulse; no cough; no lachrymation; coryza
the appearance of the eruption is very unusual. The tongue,

covered with a light white fur, except at the tip and edges, which are red, in some cases remains quite pale, clean and moist. Convulsions may take place; coma according to Valleix and Sydenham is a frequent precursor.

Eruptive stage.—The eruption generally appears first on the face and neck, whence it extends rapidly over the whole surface, increasing in extent and intensity, and reaches its maximum about the third or fourth day. It consists of small dots, in color bright scarlet, most intense at the centre of the dot, fading toward the periphery; confluent by their margins, so as not to leave any skin of normal appearance between; completely disappearing under pressure, and rapidly reappearing when the pressure is removed. The surface of the eruption is smooth and even to the touch, unless as sometimes happens, it is accompanied by the development of miliary vesicles, or crops of minute pimples or pustules. The skin upon some parts of the body, especially the face, hands and feet, presents a swollen appearance, and renders the movement somewhat stiff. There is in most cases a feeling of burning, irritation and itching in the skin which increases as the malady progresses. The characteristic appearance of the eruption is that of an uneven, vivid, scarlet color, like that of a boiled lobster. In some cases, however, the eruption appears in patches of uncertain size, and irregular form, which never affect any definite shape, and never present a clearly circumscribed margin. Examination of the throat reveals increased redness of the soft palate, uvula and tonsils, the posterior wall of the pharynx and the tip of the epiglottis. Swelling of the parts is very great from œdema, and excess of secretion within the tonsils. During life the same secretion often appears at the mouths of the tonsillar crypts, or is exuded so as to cover the surface with a uniform layer; this may be mistaken for ulcers or sloughs. Difficult deglutition, snoring, and alteration of the quality of the voice, (*i. e.*, thick and nasal) are results of swelling of the throat. Œdema of the glottis may take place. The lymphatic glands at the angles of the lower jaw become enlarged and tender; in fact inflamed. In severe cases the connective tissue around is involved and puffy, but neither brawniness or suppuration occurs before the eruption begins to fade. The tongue is rough, dry and intensely red, a condition which is known as the "strawberry tongue"; and is due to the swelling of the papillæ. Sometimes the papillæ project through the white or yellowish fur which coats the tongue. Vomiting during this period is rare; constipation is the rule, but diarrhœa sometimes takes place. *The urine* at this stage usually presents the ordinary febrile characters; it is diminished in quantity, and is often of high color. The urea is not increased, which Ringer regards as indicating that the kidneys are affected from the beginning of the attack. Uric acid appears to be retained during the pyrexia, and excreted in excess so soon as it begins to subside. Bile pigment is present, and *Phosphoric acid* also diminished in quantity.

The temperature in scarlet fever varies with the varying intensity of the disorder. It rises rapidly at the onset to 104° or 105° F. Woodman states that the temperature being 105° Fah. on the first day, till on the sixth day it reaches 100° Fah., and in about two days more has regained its natural standard. According to Ringer, the curious law obtains, that, in a large majority of cases, the temperature falls decidedly on the fifth day of the disease, or on the tenth, or on some other multiple of the fifth. If after the fall on the fifth day, it should rise again to any considerable extent, some complication may be inferred. In fatal cases there is much irregularity. The temperature before death rises sometimes to enormous heights, to 110°, 111°, and even to 115°. Delirium, which occurs during the night is not a grave prognostic, yet it is a prominent symptom of some of the worst cases of the disease.

Stage of Decline and Desquamation.—The eruption reaches its height about the third or fourth day, then remains stationary for one or two days, and afterwards declines gradually, so that no traces are left on the sixth, usually, or at most in rare cases, on the ninth or tenth day. It may disappear earlier than the fifth day, but such cases are not common. The other symptoms, both general and local, decline with the eruption, the pulse loses its frequency, and falls to the natural standard, the heat of the surface first subsides, then disappears; the redness and swelling of the tonsils and pharynx diminish; if patches of false membrane are present, these are thrown off, deglutition becomes easy, the tongue cleans off, becomes reddish and glossy, and returns to its natural state. At the time that the subsidence of all the symptoms takes place, desquamation begins. It commences in most of the cases on the face and neck though in a few instances it appears first on the abdomen. It then extends gradually over the body and becomes general. The epidermis is dry and shining, has lost its pliability, and is easily thrown into fine wrinkles. Where the cuticle is delicate, it everywhere becomes scurfy, and is so thrown off; where thicker, it is raised and removed in small, isolated patches, which increase in size by a continuous desquamation of their margin, until they meet, and so leave the whole surface desquamated; and in situations where the epidermis is very thick, it separates in large flakes or in pieces large enough to form molds of the fingers and toes, or even of the hands and feet. Sometimes the nails are thrown off. The process is attended with a good deal of itching, irritation, and tenderness. Its duration is from a few days to a month or more. The amount of desquamation depends very much upon the previous intensity of the eruption; where the latter has been slight, there the former may be almost absent. Miliaria cause an abundant and early desquamation.

Such is normal scarlet fever, it remains to trace the disease to its extremes, of severity on the one hand, and of mildness on the other.

Scarlatina maligna.—This form may present two types, the first of which is denteropathic, or, secondary, to a state of ataxia or excessive disorder of the functions of the nervous system. The invasion symptoms are all well marked, yet even from the first, those which are to be referred to a disturbance of the nervous system predominate, delirium, agitation, sleeplessness. The premonitory stage, over the eruption comes out well, the sore throat is considerable, the fever runs high. Delirium remains, exists at all times, and is active; the patient throws himself about, gets out of bed, sings loudly; his mind is confused; the eyes . bloodshot; pulse frequent, full and soft; extremities warm; vomiting after food is a prominent symptom; there may be diarrhœa or coryza. But depression follows in a day or two, the delirium is much less active, the person lies muttering, the pulse becomes small, weak, and still more frequent, the face becomes dusky, the cutaneous circulation is remarkably sluggish, swallowing is imperfectly performed, vomiting may persist, the abdomen is tympanitic; stupor supercedes delirium and death ensues. Sometimes the fatal issue is accelerated by a sudden attack of convulsions, the pulse ceases to be perceptible, the whole surface is blue, and coma follows. The tonsils in this form become the seat of sloughing ulcers leaving ragged sores. In the second type of malignancy, the vital debility is primary and spontaneous, and life is at once overwhelmed. The patient becomes suddenly pale and faint, vomits; the vomiting is repeated at short intervals, the bowels are relaxed, the hands twitch, there are great anxiety and feeble delirium. In a very few hours the depression is extreme, the whole exposed surface feels cold, yet the temperature of the armpit is febrile; the pulse is very small and frequent. Perhaps for a time, the patient seems to rally, and sits up in bed, but the pulse remains very frequent, and the feet are cold; a faint eruption may appear. Depression returns, the face becomes pale, livid, and perfect stupor (interrupted by convulsions) supervenes; pulse excessively weak and frequent, respiration remarkably irregular, sweats break out, and the skin is cold and mottled; these symptoms precede death. The duration of the whole attack may be less than twenty-four, or even less than twelve hours. Another class of cases runs a course like the following: For the first day or two the attack does not seem to be unusually grave; but about the third day the patient is alternately restless and heavy, pulse frequent and feeble, expression vacant, face pale and thick looking, mouth very tender, sweats follow a slight exertion; coryza, diarrhœa, tympanitis, ulceration of the tonsils, and dysphagia supervene, some or all; delirium is frequent, emaciation proceeds rapidly, and the patient dies exhausted, it may be during the first week, or not till far on in the third.

Scarlatina anginosa.—In this form the stress falls upon the throat. The swelling of the glands and cellular tissue around the neck is so great as to form a so-called "collar of brawn" from ear to ear. There may be ulceration, and sloughing of the fauces and pharynx, and posterior pharyngeal abscess. The mouth is opened with difficulty, there is great dysphagia, and liquids return through the nose. The inflammation often extends to the ears through the eustachian tube, and is followed by a purulent discharge from them.

The eruptions in these deviations from the normal type is of little clinical significance; it is often abundant and of good color. In the worst cases death occurs before the eruption appears.

Scarlatina latens.—This form occurs oftenest in those who have had an attack of scarlatina, and become exposed again to its contagion. But it is important to remember that the mildest form of scarlet fever may give rise to the very gravest sequelæ, and to the most malignant varieties in persons exposed to their infection.

Popularly *scarlatina* is, in some places, supposed to be the proper name for an unusually mild form of scarlet fever. It is important for physicians to correct this error, as it induces a want of care not onl in regard to the patient, but as to exposure of others to the contagio

The mildest cases may, by contagion, give rise to others of the greatest severity, and very light cases may be followed by considerable dropsical effusion.

Sequelæ.—(1.) Ulceration and sloughing of fauces and pharynx; this is due either to a simple persistence of the ulcerated condition of the tonsils, which has been described as an occasional symptom of the eruptive period, or to the establishment of a new form of lesion. The latter supervenes most frequently on the sixth day, sometimes a day or two later, but never after the second week. (2.) Retro-pharyngeal abscess; this does not differ from that occurring under other circumstances. (3.) Scarlatinal bubo. This may be either an inflammation and suppuration of cellular tissue around the parotid, that gland remaining itself unaffected; and inflammation and suppuration of the lymphatic glands around the parotid, the parotid still unaffected, or more rarely inflammation of the parotid itself. The rapidity with which the hard brawny swelling will establish itself is remarkable; a neck which was only puffy one day may be hard the next. If resolution does not take place, softening ensues at places, and here the skin will slough in order to give exit to a shreddy sero-pus, yet the swelling is not diminished until large sloughs of the connective tissue come away, and the skin (it may be of the whole neck) is left floating over the parts beneath, and perforated with numerous holes. Hæmorrhage from the large vessels of the neck sometimes occur to increase the complication. (4.) Otorrhœa may present itself in either of two forms one in which it begins in the external meatus, the discharge whitish at first; becomes purulent later. The other kind of otorrhœa is that which follows coryza, ulceration of the lining membrane of the tympanum, necrosis of bone, incurable deafness and abscess of the brain. These cases are purulent from the first. (5.) Bronchitis and pneumonia are rare, and not necessarily fatal. (6.) Pleurisy and pericarditis are more common than the preceding. (7.) Diarrhœa is a dangerous sequelæ often depending on follicular entero-colitis. (8.) Abscesses. (9.) Affections of the joints. Tenderness, redness, and swelling of the joints are all very common after scarlet fever. These symptoms mostly occur about or a little before the time of desquamation; moreover a tendency to suppuration is shown, which in true rheumatism never appears. There are all grades of severity between transitory pain in a single joint and painful swelling of nearly all the joints of the body. About the same time is often heard a systolic murmur at the heart's apex, but this is by no means due to rheumatic endo-carditis. (10.) Renal dropsy. This is a common and very fatal sequela, and occurs in about one sixth of the cases. Albuminuria is usually the first symptom of the coming mischief. It may occur as early as the first week, or it may not be found till the third. The twenty-second day has been found to be a common day for dropsy to make its appearance. With the albuminuria is considerable pyrexia, the skin becomes again hot and dry, the process of desquamation ceases, the appetite is lost, the bowels become constipated, and in a day or two puffiness is noticed about the eyes, followed by some œdema of the hands and feet, and these again may be followed by large serous effusions into the various serous cavities, the swelling and anasarca may increase, and the urine becomes more and more scanty. If the urine be examined, it is found to be smoky in appearance and highly albuminous. The microscope reveals blood corpuscles, epithelial cells and granular and epithelial casts. The final effusion may be peritoneal, pericardial or pleural. In mild cases which go on to convalesence, albuminuria is often persistent for a long time after the disappearance of the dropsy. (1). Scarlatinal vaginitis or muco-purulent discharge from the vagina is by no means rare. (West, Gee, Watson, Ellis, Meigs.)

Diagnosis.—The eruption may be confounded with that of measles, variola, rotheln, roseola, miliaria or urticaria. To know that the minute vesicles of miliaria and the confluent wheals of urticaria are not unfrequently mistaken at first sight for the scarlatinal eruption, will suffice in most cases for the diagnosis. In simple scarlatina the very earliest symptom is a more or less uniform redness of the middle of the soft palate, uvula, anterior pillars of the fauces, and tonsils, never the posterior wall of the pharynx alone. On the other hand in small-pox, the part first affected is the posterior wall of the pharynx; while in measles the posterior walls of the fauces and neighboring parts of the pharynx are always redder than the anterior pillar and soft palate. (Monti.) In rotheln and measles the tonsils are red and swollen early in the disease, but in simple scarlet fever for the first twelve hours, there is very little swelling of the affected parts. In general terms it may be said that when the soft palate has a diffused red hue, similar to, but deeper than that of the skin, while the tonsils are not involved; when with this is a very hot skin, a very quick pulse, vomiting, a tongue with thick creamy furred borders and prominent papillæ, and a previous exposure to the scarlatinal contagion, the physician need not hesitate in pronouncing it scarlet fever. It is said that the eye very early in the disease assumes a brilliant, glistening stare, very different from the watery eye of measles.

Therapeutics.—Altogether in our modern scarlatina, *Bell.* is not nearly as often and absolutely indicated as one would suppose; it is really appropriate in cases *where the smooth scarlet exanthem is accompanied by headache and congestions*, and more or less symptoms of cerebral irritation. If paralysis of the brain threaten, *Sulph.* or *Zinc* alone helps. *Sulphur* when given in the precursory stage of the disease, and followed up sometimes with *Calc.* c., will in many instances impart a benign character to the disease, so that often no other treatment will be required to secure an easy termination without dangerous complications. If the exanthem should recede again after it was fairly out, *Bryonia* will often bring it out again, and with *Cuprum* and *Apis* will often avert the ensuing and threatening cerebral symptoms; if the chest is seriously affected, *Ipecac*, or still more certainly, *Calcarea* will help; if the exanthem remains very scanty, with typhoid symptoms, *Arsenic* may very generally be depended upon, likewise *Rhus tox.*; *Verat. alb.*, if it has a bluish or violet color, with a feeble pulse, or likewise *Amm. carb.* If the angina is very prominent and the cellular tissue in the neighborhood of the cervical glands is very much swollen, *Calcarea* is to be applied to; if the chest is seriously invaded and the lungs are threatened with paralysis, *Calcarea*, *Phosph.*, or *Carbo veg.* are the remedies; if the central symptoms are most prominent, *Sulph.*, *Zinc*, *Cuprum*, *Bell.* If hydrocephalus threatens, no remedy is better calculated to counteract this dangerous condition than *Hellebore*. *Belladonna* is scarcely ever of use in such cases; *Zinc* is sometimes a good remedy. If gangrenous angina supervenes, the case is often desperate; *Ars.* and sometimes *Carbo veg.* or *Ammonium carb.* may afford relief and save the patient. When parotitis takes place, if the swelling is seen at the onset there is no better remedy than *Rhus tox.*, and if this does not help very speedily, *Arsen.* or *Calcarea*, likewise *Baryta c.* (*Carbo veg.* has removed obstinate enlargements of this gland, together with induration of the cellular tissue). If dropsy sets in after scarlatina, *Arsenic* and *Apis* generally help most; sometimes *Hellab.*, *Bry.*, *Colch.*, *Lyc.*, *Sulph.*, *Calc.*

Aconite.—The rash is not smooth. Miliary rash of a darkish hue; there is evidence or expression of fear, and the patient does not wish to be alone; red face which turns pale on rising; full quick pulse, dry hot burning skin, fever, restlessness; headache, peevishness which revolts against all interference; or, at a later period, sudden excruciating pain in stomach, gagging, retching, vomiting of blood, stoppage of breath; distressed face, anguish, cold sweat on forehead, gasping.

Ailanthus.—The rash is of a *brown* appearance and is miliary, covering the entire body or appearing in patches here and there; the teeth are covered with a brown slime, or sordes; pulse very rapid and small. The color of the rash and the exhaustion are most characteristic; adynamic malignant scarlatina; general prostration, marked cerebral affection; pulse small, weak, often irregular, skin generally harsh, hot, and dry; livid eruption, more profuse on forehead and face; violent vomiting, dizziness, photophobia, muttering delirium, stupor and insensibility; pupils dilated; great thirst, with dry parched tongue; throat congested, dark-colored, in some cases ulcerated and attended with great glandular swelling; torpor, skin cold and dry; after pressing with the finger the color returns very slowly; great exhaustion; petechiæ.

Ammonium carb.—The eruption is only faintly developed, with drowsiness, stupor, dry mouth, and burning pain; malignant scarlatina, with disposition to torpor and colliquation, when there is danger of gangrene; putrid sore throat; hard swelling of the right parotid and lymphatic glands of the neck; enlarged and livid tonsils, covered with a rapidly degenerating, sticky, offensive mucus; burning pain in throat; sticky salivation; faintly developed eruption; heaviness of head, drowsiness; stertorous breathing; involuntary stools; threatened paralysis of brain, with excessive vomiting.

Apis.—The eruption is characterized by red spots or points diffused here and there over the body; sudden, sharp outcry during sleep; squinting; the eruption may have disappeared suddenly leaving the above described red spots or points; high fever, with chilliness from least movement; heat of feet and hands when patient complains of chilliness; headache, holds head in hands; burning and stinging of skin; dryness of throat; tongue dry, of deep red color, swollen and inflamed, often covered with blisters; inability to swallow; dryness of mouth, without thirst; tonsils swollen and hard; nausea and vomiting, with soreness of pit of stomach to touch; nose stuffed up; skin red, hot and sensitive, somewhat relieved by cold sponging: great restlessness and nervous agitation; suppression of urine, urine scanty and high-colored, voided with difficulty; anasarca condition, with very scanty urine; oppressed respiration, great trembling; heat of skin and fever changeable, comes in flashes; delirium, the patient is inclined to scream out; post-scarlatinal dropsy, aggravated by heat, relieved by cold; scarlatina typhosa, the whole nervous system resting under the paralyzing influences of the poison.

Arnica.—Typhoid state, with epistaxis or hæmoptysis, worse by coughing; ecchymosis on different parts of body, or even small boils.

Argentum nit.—Bluish or blackish eruption, with convulsions, with great restlessness and tossing about preceding every convulsion; emission of a large amount of flatus, which passes off with a quantity of greenish slime.

Arsenic.—Thirst for frequent sips of water; great restlessness and marked exhaustion after every movement; typhoid forms, especially at the commencement; the eruption delays or grows suddenly pale, livid, intermixed with petechiæ; total loss of strength, mild delirium, convulsive twitching of tendons, with excessive vomiting; violent diarrhœa, brought on or aggravated by drink or food; tendency to gangrene; lips dry, black, often bloody; grinding of teeth while asleep; tongue dry, brown, cracked; thick, slimy, fetid saliva in mouth; longing for cold drinks and acids; bitter taste, especially after eating or drinking; vomiting of brown substances; urine dark colored and bloody, passed with difficulty; emaciation; dyspnœa, constantly changing position; cold sweat, cold extremities; puffiness of eyelids; dropsical symptoms.

Arum triph.—Malignant scarlatina. Intense fever; soreness of mouth and fauces, which spreads to posterior nares; nose stuffed up; ichorous discharge from nose, excoriating and furrowing the upper lip; discharge from nose thick and yellow, filling whole nasal cavity and throat; wings of nose ulcerated; upper lip red and sore from excoriating discharges; mouth covered with ulcers, with intense burning and soreness; saliva acrid; tongue red and sore, with elevated papillæ; putrid sore throat, swollen submaxillary glands; moist cough, with excoriated feeling in fauces and larynx during day, and spasmodic night cough, compelling him to sit up; urine abundant and pale; eruption all over body, with much itching and restlessness; stiffness of neck.

Aurum.—Fetid discharge of mucus from the nose, or from otorrhœa of a similar nature, especially if bones come from the ear.

Baptisia.—Typhoid scarlatina. Extensive ulcerations in throat;

great fetor of breath; nausea, followed by vomiting; tonsils inflamed; diphtheritic ulcers; dry sore tongue, coated at first with reddish papillæ here and there, followed by a yellowish-brown coating in centre, edges red and shining; slight delirium; burning heat of face; oppressed breathing; dysenteric stools; scalding high-colored urine; continued fever, with great prostration.

Baryta carb.—Where the child is dwarfish; the submaxillary and parotid glands are swollen and tender; skin scarlet and smooth; congestion to brain, with delirium; horrible illusions on closing eyes; wants to sleep and can not sleep; anxious sleep, full of dreams, with startings; throbbing of carotids; involuntary movings of hands to head; bending head backwards; head hotter than other parts of body; eyes injected, face fiery red, or pale and puffy, or sunken; tongue white, with red edges, or red all over with raised papillæ; violent angina tonsillaris et faucium, with stitching pains and spasmodic contractions; inability to swallow liquids, which often return through nostrils; violent thirst, with or without dread of water; suffocating sensation on turning head or touching pharynx; external swelling of neck; vomiting.

Belladonna.—In the true Sydenham scarlet fever, where the eruption is perfectly smooth and truly scarlet; or scarlet fever in any form, with the following symptoms: eyeballs red and injected; the skin is so hot that it imparts a burning sensation to the hand; much delirium; jerking of muscles; throbbing of carotids; bending of head backwards; lips, mouth, and throat very red; difficult deglutition; the child moans, whimpers, jumps up in bed, and often wants to walk about in his sleep.

Bryonia.—Frequent attacks of dyspnœa; nausea and faintness on sitting up; parched lips; constipation; great thirst, the child grasps the glass and drinks with great eagerness and in large quantities; although somewhat restless the child is disposed to keep still because then feels better; delay or sudden retrocession of eruption, with symptoms of pleuritis or meningitis; dropsy.

Calcarea carb.—When the temperament is leucophlegmatic, the nose sore and obstructed, and there is slow fever, especially worse in the evening; the child appears pale and languid—does not seem to convalesce; there is great anxiety and oppression, as if the were giving out, with loud, mucous rattling. Scarlatina sorethroat, difficult deglutition loose rattling in windpipe, ho difficulty of breathing, with præcordial anguish, no cough during expiration; threatened paralysis of lungs; otorrhœa; specific for parotitis or swelling around neck, especially when eruption is already fading; aphthæ on tonsils and roof of the mouth.

Camphor.—Extremities cold and blue; rattling in the throat; the child refuses to be covered; sudden retrocession of eruption, with cold skin and complete prostration; mind in a serene conscious state, with a peculiar staring wild look; purple-colored, or pale, changeable, hot face, with hot sweat and cold extremities; hot burning pains; great sensitiveness of stomach and abdomen; involuntary blackish stools; dyspnœa, with sensation of constriction around throat, with hot breath; accumulation of mucus in air passages; skin shrivelled.

Capsicum.—Capriciousness; exhalted sensibility of all the senses; peculiar redness and burning about face, out of proportion to heat of other parts of body; throat smarts and burns, and is a deep red color burning vesicles on tongue and mouth; pain in throat, always worse between the acts of deglutition; tenacious mucus in throat, difficult to dislodge; dry tongue, without thirst.

Carbolic acid.—Restlessness, delirious at intervals, pulse rapid; white circle around mouth, rest of face dusky red; lips, mouth, and tongue black, sordes and ulcerated patches on inside of lips and cheeks; breath exceedingly fetid and repulsive; liquids on being swallowed return by nose; skin dry and scurfing off; urine high colored and scanty; abdomen slightly tympanitic.

Carbo veg.—This remedy should be considered when the soreness of the throat continues after the disappearance of the eruption; putrid sore throat; sloughing away of some of the swollen parts of the fauces; last stage, with rattling in throat and complete loss of vital power; cool breath and cold extremities, and still the patient must have air and wants to be fanned all the time; sticky cold perspiration. Sepsis; sunken features and sallow complexion.

China.—In cases threatening to become anæmic, with diarrhœa or lienteria.

Cina.—The child bores with its fingers in its nose; is very fretful, so that nothing pleases it; the urine turns milky on standing; colicky pains; the child is almost always hungry.

Colchicum.—In cases where there is bloody urine, or urine looking very black and containing albumen.

Conium.—Parotid and submaxillary glands swollen and hard as a stone; lips and teeth covered with black crusts; skin hot; delirium and unconsciousness.

Cuprum acet.—Convulsions before the eruption breaks out, or when the eruption suddenly disapdears, with tendency to metastasis to brain; quick, small, irregular pulse, low temperature; sopor; rolling of eyes; facial distortion and also of all the flexor muscles; great restlessness; throwing the body about; spasmodic action of chest; vomiting; cold face, blue lips, coldness all over; aggravation by contact.

Gelsemium.—Great nervous excitement; cold hands and feet; there is not the heat of surface nor the jerking of muscles indicative of *Belladonna.* Asthenic forms of scarlet fever; intense fever, with nervous erethism during prodromal stage, followed by profound prostration of the muscular power; cerebral intoxication; pulse frequent, soft, weak, sometimes filiform; impaired vision; heat, with languor and drowsiness; crimson flush of face in all positions; heavy-looking suffused eyes; throat feels as if swelled or filled up, is diffusely red; tonsils red and slightly swelled; delirious mutterings when asleep or half awake; spasms and paralysis; when the eruption recedes, all the viscera are threatened.

Hepar sulph.—Sequelæ retarding convalescence; croupy inflammation of nasal mucous membrane during proruption and effervescence; swelling of parotid and submaxillary glands; early decrease of the urinary secretion, with traces of albumen and cylindrical tubuli; fully developed dropsy from Bright's disease; anxious feeling about the heart.

Helleborus.—Dropsy, in consequence of morbus Brightii acutus; squinting, pupils dilated, face pale and puffed; urine, after settling, looks like coffee-grounds; bloody urine; diarrhœa of jellylike mucus.

Hydrocyanic acid.—Eruption at an early stage is dark-colored and soon becomes livid, only slowly regaining its color after pressure, with the finger; rapid feeble pulse; sinking at stomach from prostration of solar plexus; long fainting spells; involuntary stools; paralysis of œsophagus, the fluid runs gurgling down the œsophagus.

Hyoscyamus.—Rolling of the head from side to side; twitching and jerking of single muscles here and there over the body, indicative of oncoming spasms; great nervous excitability, without much cerebral hyperæmia; sleeplessness; illusions of imagination or else utter stupidity; sparkling, red, prominent eyes, or else staring at things; indistinct muttering loquacity; difficult speech; does not reply to questions, or answers slowly and relapses into his unconsciousness; bluish face; mouth open or jaws locked; constriction of throat, ca during rest; œdema of scrotum and penis; swelling and suppuration of parotid gland, first left, then right, with copious ichorous discharge; leaving a deep cavity; skin peels.

Silicea.—Scrofulosis, glands swollen and threaten to suppurate; boils, abscesses; subsequent induration of glands from tardy reconvalescence.

Stramonium.—Violent convulsions, excited by touch or sight of bright shining things, with spasmodic jerking of limbs; paralytic trembling of arms and hands, especially of the right, with which he constantly reaches into the air, and attempts to grasp some imaginary object; restlessness, with itching of skin; rash of a coppery-red color, dry and hot skin; coma, with rattling respiration and bloody froth at mouth; rapid alternation of laughing, crying, and singing; stupor; great dryness of throat, compelling frequent drinking; swelling of tongue, so that it hangs out of the mouth; paralysis of tongue.

Sulphur.—Efflorescences coalesce into large spots as red as a boiled lobster, and around these spots the skin is unusually white; cerebral affections, with sopor, sudden starting, distortion of eyes; bloated and shining red face; dry nose; dry, cracked, red tongue, covered with a brownish mucus; hot flashes, the skin hot and itching; thirst and difficulty of swallowing; lethargic condition; diarrhœa, worse in the morning.

Terebinthina.— Albuminuria and uræmia following scarlatina; intoxication, confusion, languor, relieved by profuse urination; aching pain in head, with vomiting; excessive fulness and pressure in head, causing screams; pains come and go; thirst, but drinking causes nausea and vomiting of yellow mucus; urine scanty, dark, bloody; ascites, œdema, more of the upper parts; frequent waking and tossing about in bed.

Veratrum vir.— Intense arterial excitement during febrile state, with cerebral congestion or irritation of the spinal centres; convulsions, with greatly dilated pupils, perfect sleeplessness; sequelæ, as rheumatism, dropsy, when inflammatory symptoms are present.

Zincum.— Retrocession of the eruption; threatened paralysis of brain, complete stupor; pulse small, filiform; extremities cold; jerking of body or twitching of single limb; bluish-red color of body, while forehead and face are pale; white distorted face; frightful shrill screams; short, quick breathing, but not rattling; occiput very hot; grating of teeth; involuntary micturition and stool.

As prophylaxis, *Bell.* should always be given.

DISEASES OF THE EYE AND EAR.

DISEASES OF THE EYE.

To make this work as complete as possible we add a brief chapter on the principal disorders of the eye and ear. Dr. F. H. Foster, a specialist in this branch, whose experience in the Foundlings' Home and Half Orphan Asylum especially qualify him to write, has contributed the practical articles here given.

MALFORMATIONS OF THE EYE.

A considerable number of congenital anomalies or malformations are frequently met with in the various structures of the eye and its surroundings. Each part ot the eye seems to have its own peculiar deformities which may exist alone or be associated with malformations in other parts of the organ. In almost every instance they are due to an arrest of development. The following are the principle malformations that have been met with and noted:

Ectopia tarsi or malposition of the lids. In this deformity the lids are so situated that the internal canthus is set considerably lower than the external, the appearance being an exaggeration of the expression met with in the almond shaped eyes of the Chinese. In the normal position of the lids the palpebral apertures are situated on nearly a horizontal line, but in this malposition if the apertures were continued, they would cross, forming an obtuse angle.

Epicanthus consists of a superabundant fold of skin which passes from the nose to the brow above and cheek below. The inner canthus of the eye is considerably hidden making, quite an unsightly appearance. The deformity can generally be remedied to a great extent if not entirely removed by surgical interference.

Coloboma or fissure of the eye lid is of rare occurrence. There may be a single or double fissure, and it is sometimes present in both the upper and lower lids. It not infrequently is associated with coloboma of the iris and choroid, cleft palate, hare lip, etc.

Vascular nævi frequently extend into the lids from adjacent tions of the face, or they may be confined entirely to the for They may be quite superficial, being confined entirely to the skin extend to the deeper tissues, even to the conjunctiva.

Absence of the lachrymal punctum may be congenital, though this is generally due to some inflammatory trouble; there also may be present more than one opening. These supplementary puncta are usually seen on the lower lid.

Irideremia or Absence of the Iris.— This may be either complete or partial, a small rim of iris being sometimes present at the periphery. The deformity is sometimes hereditary and is often associated with a displaced and cataractous lens. Even if this latter condition is absent, the sight is usually impaired, and the eyes have that constant oscillatory movement known as nystagmus.

Coloboma or cleft iris is generally present in both eyes, and almost always accompanied by coloboma of the choroid. It is usually situated in the lower part of the iris and is rather triangular in shape, the base of the triangle being directed towards the pupil. Simple cleft in the iris does not of itself cause much impairment of sight, but if associated with the same arrest of development in the ciliary body and choroid, considerable diminution of vision may be expected.

Corectopia or displacement of the pupil is sometimes hereditary. It may be so slight as to be scarcely noticeable, or may be so marked that only a small rim is left between the periphery of the iris and the margin of the pupil. The displacement may be in both eyes and quite symmetrical.

Polycoria or more than one pupil may exist in either or both eyes. The second pupil is sometimes situated quite a distance from the central one so that considerable iris intervenes, or there may be several minute pupils located around the normal one and only separated from it and each other by fine strands of iris.

Persistence of the pupillary membrane is very seldom met with. It consists of fine and delicate fibrillæ which pass from the iris across the pupil and may be attached to the capsule of the lens. These remains of the pupillary membrane generally give way and disappear as the child gets older.

Congenital displacement of the lens is generally met with in both eyes, is often hereditary, and is frequently seen in several members of the same family. The displacement is usually in a lateral direction the lens being seemingly pushed to one side. There is more or less amblyopia which in some cases can be materially improved by carefully adjusted glasses.

Lamellar cataract is usually a congenital affection; its structure is very peculiar, there being an opaque layer of lenticular substance lying between the nucleus and the peripheric cortical substance both of which are transparent. There is usually a history of infantile convulsions in these cases, though why they should be associated is difficult to determine. The cataract may be so slight as to escape detection in which case the impairment of vision would be slight. If the case is one where surgical interference will be required, the operation should be performed early.

Coloboma of the choroid is nearly always found in connection with cleft iris. It extends backward from the margin of the iris and may completely encircle the globe. It sometimes passes on one side of the optic nerve at other times it embraces it in its expanse. The margins of the cleft are fringed with pigment.

Opaque optic nerve fibres are due to a continuation of the neurilemma into the eye and spreading over the retina. This sheath which envelops the nerve tubules is usually dropped when the nerve penetrates the sclerotic, while the tubules themselves which are transparent pass on to the retina. The extent of these opaque fibres is generally very slight. The blind spot of the retina is increased in size by their presence, and the field of vision correspondingly diminished, but there is practically no impairment of sight.

Pigmentation on the surface of the optic disk has been observed in a few instances. It is very frequently seen in the form of a narrow crescent at the margin of the disk.

The hyaloid artery generally disappears before birth, but traces of it have in rare instances been met with afterwards. It appears as a fine thread-like opacity, passing from the optic nerve through the vitreous humor to the posterior surface of the lens. It may be well to mention that these anomalies in formation which are located behind the iris can only be observed by examination with the ophthalmoscope.

Congenital anophthalmus or absence of the eyeball is of very rare occurrence. One case was seen by the writer at Dr. Liebreich's clinic, St. Thomas' Hospital, London, some years ago. The eyelids were well formed in every respect, and on opening them the conjunctiva could be seen forming a shallow sac, but not a vestige of an eyeball was present.

OPHTHALMIA NEONATORUM.

This disease which is probably met with more frequently than any other ocular affection among infants, is when properly treated, most amenable to treatment and attended with the happiest results; left alone, or what is worse, improperly treated, the consequences are most deplorable. Many a life has been blighted and rendered useless on account of blindness caused by this trouble in infancy. It is a disease which the physician is constantly liable to meet, and a thorough knowledge of its nature, course and results are necessary in order to successfully combat it.

The symptoms are usually so well marked that there is little danger as to an incorrect diagnosis; often on the second or third day after birth there is noticed a slight swelling and redness of the tarsal margin of the eyelids and a little collection of matter at the inner canthus; this swelling of the lids rapidly increases, and in rare cases assumes enormous proportions; they are intensely red, sometimes of a dark bluish tint, and puffed to that extent that it may be impossible to open them with the fingers, this intense tumefaction being partly due to the laxity of the infantile tissue, also to the large amount of cellular tissue in this locality. The discharge by this time is very copious, collecting on the tarsal margins and running over on to the cheek; at every attempt to open the lids it wells out in a stream; it is thick, yellow, and purulent in its nature; the quantity discharged from the eyes in a single day is very great, and often seems highly improbable. On attempting to open the lids, it will be noticed that they are very easily everted; if such be the case, particular care must be taken to return them to their proper position, otherwise an ectropion may be induced; this tendency to eversion can in a measure be obviated by pressing on the margin of the lid in the direction of the margins of the orbit; very frequently it will be found that the lids cannot be opened without the assistance of a retractor: this instrument though it may look frightful to the parents and friends, can do no possible harm if used with care. In case the physician is not provided with a retractor, he can improvise one from a piece of smooth wire, or even a wire hair pin may be used; the curved end is bent upon itself for about half an inch, thus forming a loop in which the lid can rest and be drawn npwards. In every case it is desirable to open the lids and carefully examine the cornea, but if this cannot be accomplished without too much force being used the attempt had better be given up, for it has happened that between the straining of the child and the force of the surgeon, an ulcerated cornea has been ruptured and the lens forced out, an accident which is anything but desirable. However it is very seldom that a view of the cornea cannot be obtained by a patient and careful manipulation of the lids. After raising the lids and clearing away the discharge it will be seen that the palpebral conjunctiva is intensely red, swollen and thrown into horizontal folds; if examined carefully the discharge can sometimes be seen oozing out of the vascular surface; in some cases a greyish exudate or membrane covers the conjunctiva which bleeds very easily; this should not be mistaken for the diphtheritic process. The ocular conjunctiva is reddened and swollen; at its junction with the cornea it may be considerably elevated and overlap the margin of that membrane, thus forming true chemosis. The cornea should be most carefully examined, for upon its integrity the prognosis is to be made; it should present a clear, bright, reflecting surface, and any deviation from this must be regarded as a commencing implication of this structure in the purulent disease. Care should be taken that all the discharge is carefully removed from the corneal surface, otherwise it might be mistaken for ulceration. The first thing noticed if the cornea is becoming involved will be a faint opacity or steamy appearance, situated at or near its centre; this is confined entirely to the epithelial layer, but spreads rapidly both in depth and area, and unless arrested, the cornea may become partially or completely infiltrated; it then has the appearance of a dense white opacity, of greater or less size, according to the amount of the cornea involved; the margins of the ulcer may be sharply defined, or they may be shaded off by a fainter and less dense opacity which obscures any vision of the iris.

Causes.—If we remember that the mucous membrane of the eye undergoes a positive hyperæmia, we can readily understand how this inflammation may result from irritation. Contagion is the most frequent cause of ophthalmia neonatorum; the eyes frequently become infected from some discharge during the passage of the chil
the vagina, thus gonorrhœa or leucorrhœa in the mother m
exciting cause; a lack of attention to cleanliness, or carele
washing the eyes, as with impure sponges or napkins, may
to the disease, also exposure to a foul atmosphere or cold w
infrequently the cause can be traced to a direct exposure of th

tively) if not used than any other drug; there are some ophthalmic surgeons who depend almost wholly upon it in the treatment of this trouble, and who say they have seen all the symptoms of the most intense form of ophthalmia neonatorum disappear under the administration of *Argentum nitricum* 30.

Calcarea carbonicum may be thought of during the course of the disease, but it will be of special benefit in clearing up opacities which are left after ulceration of the cornea; in these cases the best action will be obtained from the 30th or 200th potency.

Hepar sulphur is the remedy where the cornea is affected, especially if the ulceration is extending rapidly and accompanied with hypopion.

Mercurius or Nitric acid may be given where suspicion directs attention to the vaginal discharge as a possible origin of the disease.

In case the cornea is perforated and does not heal readily but fills with a thin membrane that shows a tendency to bulge, *Silicea* may cause the opening to fill with firmer tissue. Other remedies to be thought of in this disease are, *Arsenicum*, *Euphrasia*, *Pulsatilla*, *Rhus tox.*, and *Sulphur*.

PHLYCTENULAR OPHTHALMIA.

Under this title will be included both forms of the disease, that is the conjunctival and corneal variety, the symptoms, causes and treatment being essentially the same, the main difference being in the location of the phlyctenulæ.

Symptoms.—The disease usually commences with a smarting-burning feeling in the eye, often compared to the sensation from a grain of sand; these symptoms increase until they amount to absolute pain; the photophobia is generally intense, in fact there is scarce any affection of the eye where this symptom is more marked; any attempt which is made to open the eye will set up a spasm of the orbicularis muscle which is very difficult to overcome with the fingers; if the lids are opened it will be found that the eye is rolled upwards and great difficulty is often experienced in getting the child to look down sufficiently to obtain a view of the cornea. In order to make a thorough examination it will sometimes be necessary to administer an anæsthetic to break up the spasm of the orbicularis; this procedure will often have a decided beneficial influence on the photophobia. The intense dread of light is frequently out of proportion to the amount of inflammation present, and may even persist after all inflammatory spmptoms have disappeared, so much so that it would seem to have become fixed as a habit. It is not infrequently the case that after suffering from an attack of phlyctenular ophthalmia, the child insists on wearing the shade and avoids all strong light after the eyes to all external appearances are well. The lachrymation is generally profuse, the tears being hot and scalding so that the edges of the lids and cheeks are red and excoriated from the constant overflow; the tears may be mixed with a mucus, or even muco-purulent secretion, as the disease is sometimes associated with catarrhal conjunctivitis. On opening the eyes there may be noticed considerable redness of the ocular conjunctiva, or it may be very slight and localized; on looking closely there will be seen one or more small transparent vesicles, situated usually at the margin of the cornea. These phlyctenulæ constitute the distinguishing characteristic of the disease, and run a course similar to an herpetic vesicle, their contents become turbid and the vesicle bursts leaving a small superficial ulcer. A phlyctenule runs its course in from seven to ten days; as has been previously mentioned, they may be located anywhere on the ocular conjunctiva or the corneal surface, but a favorite point for them seems to be just at the junction of these two structures where several may sometimes be seen almost completely encircling the cornea; when they are situated on the cornea, the pain, photophobia, and all the symptoms of irritation are very much intensified. This disease is frequently associated with eczema, which affects the outer canthi of the lids, the cheeks, nostrils, and even behind the ears; enlargement of the glands about the neck will often be found accompanying it.

The *cause* of phlyctenular ophthalmia can often be referred to an impoverished and illy-nourished condition of the general system; bad air, improper food, and imperfect assimulation contribute largely to the production and maintenance of this disorder. The so-called scrofulous (lymphatic) diathesis forms the basis of a large per cent. of the cases, so that some authors speak of the disease as scrofulous ophthalmia; that this term will not apply to all the cases, we have ample evidence in the fact that the disease is met with in those subjects who are free from any trace of those other characteristics which go to make up the scrofulous picture. The most obstinate cases are sometimes found in apparently the healthiest children, livir the best hygienic conditions and surrounded with all the comforts of life. Phlyctenular ophthalmia not infrequently accompanies or follows an attack of one of the acute exanthemata; it is essentially a disorder of childhood, being seldom met after the stage of puberty.

The *prognosis* may be considered favorable, though the ultimate recovery is often tedious; relapses are frequent, being rather the rule than otherwise; the chief danger to the sight comes from the scars which are left on the cornea after the healing of the ulcers; these spots, or maculæ as they are termed, may be located immediately over the pupil in which case there will be considerable obstruction to vision, as a rule, however, they are largely absorbed in the course of time. It is seldom that a phlyctenule gives rise to an ulcer which takes a suppurative form, though it may happen and perforation of the cornea result as the consequence.

The *treatment* consists in endeavoring to cut short the acute attacks, to prevent any serious extension of the ulceration which may be present and to guard against further recurrences; in order to accomplish the latter considerable attention will have to be given to the general surroundings and habits of the child; the food should be wholesome and nutritious, and partaken of regularly; in quite a number of the cases it will be found that the custom is to drink tea and coffee; this should be prohibited. The child should not be kept in a darkened room, but encouraged to bear a certain amount of light, and in pleasant weather should go into the open air some time every day. A systematic course of bathing with salt water, or what is better with a solution of sea salt, will have a tonic and invigorating effect. I generally direct that the attendant shall give the patient a complete bath two or three times a week, the temperature of the water to be regulated according to the weather. Where the pain and photophobia are very great, two drops of a solution of *Atropia*, two grains to the ounce of water had better be put into the eye once or twice a day; if the spasm of the lids is very intense the nurse may not be able to accomplish this; in such a case *Belladonna* can be substituted, a teaspoonful of the tincture being put into a teacup of hot water, cloths wet in this are to be laid on the closed lids; they should be changed every minute in order to keep them hot; tincture of *Hydrastis* can be used in the same way; these hot applications frequently have a very decided effect on the photophobia so that the child will partly open the eyes directly after the cloths have been removed. In order to protect the eyes from the direct rays of light, a shade made of pasteboard and covered with black silk can be worn.

The following are the main remedies to be depended on in the treatment of phlyctenular ophthalmia:

Arsenicum.—This remedy will very often be indicated, particularly if the cornea is affected; the ulcers left by the phlyctenules appear as small white dots the size of a pinhead or even less; there may be a leash of conjunctival vessels running to the margin of the cornea, or this may be absent. There is generally a profuse flow of tears which are hot and acrid so that the check is excoriated by the constant overflow. The photophobia is intense and the pain complained of is often of a burning nature.

Calcarea carb. is particularly indicated in children where the strumous diathesis is marked. The patients are very susceptible to every change in the weather. Eruptions on the face frequently alternate with the pustular inflammation of the eyes. The remedy may be continued after the ulcers have healed, and will have a beneficial influence in clearing up the opacities.

Calcarea jod. is to be thought of when there is enlargement of the tonsils or glands of the neck. For this condition the *Iodide of Baryta* is also useful.

Conium.—Cornea generally affected. The pain, photophobia, and lachrymation are marked and out of all proportion to the amount of conjunctival redness present which is very slight.

Croton tig. is associated with a pustular eruption of the lids and face.

Graphites.—This remedy is probably prescribed as often as any we possess, and is applicable to any form of the disease. The phlyctenules come in crops and show a constant tendency to recur, even after the eye has been apparently well for two or three weeks. There is often an eczematous eruption which affects the scalp and behind the ears; also the tarsal margins, particularly the outer canthus which is cracked and bleeding. The pain and photophobia are varying, may or may not be present.

Hepar sulph.—When the ulcers take a suppurative form, and there is a tendency to sloughing of the cornea. There is great conjunctival redness and the inflammatory symptoms are marked; the pains being severe and throbbing, extending over the brow; better from hot applications.

Mercurius.—Nearly all the preparations of *Mercury* have done service in the treatment of this trouble. It is particularly adapted to the cases occurring in those subjects afflicted with hereditary syphilis. The conjunctiva is red and chemosed, often encroaching onto the cornea. The photophobia is intense and worse by artificial than day light. The lachrymation is profuse and acrid, and floating in the tears are seen mucus flocculi. The pain is severe, extending into the head; worse at midnight and in damp, cold weather. The tarsal margins are raw, as also are the nostrils which are filled with crusts.

Mercurius cor. is more to be thought of in the severer cases where the ulceration is confined to the cornea, and all the above symptoms are greatly intensified.

Mercurius jod. may be given where the disease is accompanied with enlarged cervical glands. There is generally a thick yellow coating at the base of the tongue.

Pulsatilla is particularly adapted to phlyctenular conjunctivitis. The phlyctenules appear as large, white, flat spots, only slightly elevated. There is frequently very considerable conjunctival redness. There may be very little photophobia, and the discharge though quite profuse is bland and not excoriating. The lids are inclined to localized swellings like styes; indeed the disease frequently terminates in this way by leaving the conjunctiva and settling in the tarsal margins, thereby inducing a blepharitis. The peculiar *Pulsatilla* temperament being present would furnish additional indications for this remedy.

Rhus tox. is more useful where the cornea is affected. The eyelids are red, swollen, and œdematous, and when forcibly opened the tears spurt forth in a stream. The conjunctiva is intensely red. The skin about the lids is covered with an eruption. The patient suffers more pain at night and in cold, damp, wet weather.

Sulphur is used in both phlyctenular conjunctivitis and keratitis. It is adapted to a large variety of cases, particularly those where the scrofulous habit is well marked and there is a great tendency to recurrence. The pains are sharp and sticking, as if a knife was plunged into the eye; there may be an absence of pain, and instead a burning-smarting sensation, or a feeling as of sand in the eye. The photophobia is unusually intense, so that the child cries if taken into a light room or any attempt is made to open the lids. Lachrymation is profuse, acrid, and excoriating, is frequently mixed with a muco-purulent discharge. The lids are red, swollen, and gummed together in the morning.

Other remedies which have been useful in phlyctenular ophthalmia are: *Argentum nit.*, *Chin. arsen.*, *Kali bich.*, *Lachesis*, *Mezereum*. *Natrum mur.*, *Psoricum*, *Petroleum*, *Thuja* and *Zincum*.

CHRONIC INTERSTITIAL KERATITIS.

This is essentially a disease of children, being much more frequently met with before than after puberty. The disease generally commences with a diffuse haziness near the central part of the cornea of one eye. This opacity if examined closely is found to consist of small dots or points of infiltration in the substance of the corneal tissue. These deposits increase rapidly in size, some of them coalesce with others and gradually the whole cornea becomes opaque excepting a narrow band near the margins which commonly remains transparent. At this stage the cornea presents the appearance of ground glass, though there is still a greater density of certain parts. The conjunctival and subconjunctival redness varies. In the severer cases it is quite marked, and sometimes extends on to the cornea, so that the appearance is not unlike an extravasation of blood. If this patch is carefully examined, it will be found to consist of minute blood vessels closely packed together. The pain, photophobia and lachrymation all vary according to the severity of the disease; if these symptoms are prominent, it usually indicates an extension of the inflammation to the iris and ciliary body. This unfortunate complication is not infrequently induced by injudicious treatment as by astringent and other local irritants. Ulceration of the cornea is rare. Both eyes are generally affected, the disease commencing in the second eye a month or two after the first and running a similar course. The prognosis is favorable; complete blindness when the trouble is confined to the cornea is rare, though some impairment of vision may be expected unless the opacity is all absorbed, and a slight nebulous condition of the cornea frequently remains. Recovery is very tedious, the duration being often from twelve to eighteen, or even twenty-four months. With regard to the cause of this disease, though the question is still a mooted one, nearly all the present writers agree in ascribing it to inherited syphilis. Thank labors of Mr. Hutchinson, who for a number of years has great deal of attention to the subject, we now recognize physical type as that presented in the children of syphilitic The frontal prominences are large and well marked. The narrow and pinched, the nasal bones being small, while their inferior margins end very abruptly. The angles of the mouth and cheeks are scarred from former ulcerations, while the skin is course in texture and of a peculiar earthy hue, so that the general appearance is that of premature senility. The permanent teeth also exhibit peculiarities in their formation which are very characteristic of the inherited diathesis. The incisors are dwarfed and stunted, often considerable space existing between them ; the two central incisors often converge towards each other, and their lower margins present a peculiar concave or crescentic notch. All of these features may not be present in every case of interstitial keratitis, but in obtaining a thorough history, other children in the family should be examined, and very often some of the previously-mentioned peculiarities will be noticed. The history of the parents should also be carefully ascertained.

Treatment.—In speaking of the local treatment of interstitial keratitis, I wish to emphasize that *all applications* made to the eye during the stage of inflammatory irritation *should be of a mild and soothing nature.* Not infrequently iritis and cyclitis have been induced from the use of irritating lotions. *Atropine* should be used so long as the acute inflammatory symptoms last; one or two drops of a two-grain solution should be instilled into the eye two or three times a day, or the solution may have to be stronger if the pupil fails to dilate. If the pain and photophobia are very great, hot fomentations of *Belladonna* or *Poppy leaves* can be used several times a day ; they should be applied in the same manner as directed for phlyctenular ophthalmia. After the inflammatory stage has passed these measures will be unnecessary, though if iritis has been present and adhesions between the iris and capsule of the lens still exist, the *Atropia* may be continued for some time, in hopes that they may be broken up, and the pupil left free. The opacity of the cornea still remains to be cleared before much improvement in vision can be expected and in order to hasten this the dusting into the eye of a small quantity of finely pulverized *Calomel* is often resorted to. This should not be repeated more frequently than once a day, or even two or three times a week, and if the irritation caused by its use is at all lasting, it should be discontinued. The principal remedies that have proved of service in the treatment of keratitis interstitialis, are *Aurum mur.*, *Baryta jod.*, *Calc. jod.*, *Cannabis sat.*, *Hepar sulph.*, *Kali hyd.*, *Merc. jod.*, *Merc. cor.*, and *Nitric acid.*

Aurum stands pre-eminently at the head of the list, and is probably oftener used than any other remedy, but when we recollect how closely the pathogenesis of this drug corresponds to the syphilitic condition, it becomes at once apparent why it is so frequently curative. The lower potencies are more commonly used. It acts well in those cases where the inflammatory symptoms predominate, also when they are very slight.

Mercurius jod.—Next to *Aurum* probably this preparation of *Mercury* is oftener indicated. It is particularly to be thought of when iritis or cyclitis exists. There is great pain in the eyeball, worse at night, and excessive tenderness over the ciliary region. Painful enlargement of the cervical glands are frequently present. *Baryta jod.* and *Calc. jod.* are also to be remembered in connection with this latter condition.

Cannabis sat. and *Nitric acid* have been very serviceable in clearing up the corneal opacity; they sometimes are given in alternation, or what is better, one remedy is administered for a week and then followed by the other.

FOREIGN BODIES IN THE EAR.

Among the many difficulties of the ear that the physician will be called on to relieve in the little folks, will be the extraction of foreign bodies from the auditory canal. Some children seem possessed with the habit of putting things into their ears, even after having had some pretty severe experience in the removal of former articles. Not infrequently insects of various kinds find their way into the ear of the child when asleep; this being more liable to happen in warm weather. A living insect in the ear may cause considerable pain; this may be produced by a bite or from the scratching by their feet, which are frequently sharp and pointed; such a wound as this which on the surface of the skin would be considered trivial, is all sufficient when directed to the delicate and sensitive tissues of the inner extremity of the canal and drum membrane to cause considerable apprehension and suffering on the part of the patient. The larvæ of insects are sometimes found deposited in the canal; this probably is more frequently noticed in cases of neglected otorrh than any other subjects, but inanimate objects form by far the m frequent articles that children, or sometimes their foolish attenda are so fond of putting into the ear. Such things as seeds, butt small pebbles, bits of chalk, in fact almost any small article that child can get hold of, may find its way into the ear.

When it is once discovered, or even surmised that a child has something in its ear, no effort is spared for its immediate removal, and it is not infrequently the case that far more injury is done by the *determined and energetic measures* resorted to for removing the object, than months of its presence in the auditory canal would accomplish. The fact is that foreign substances in the ear as a rule, do not produce much harm. Very often they have remained for a period of months without causing any irritation or deafness. A case is on record where a glass bead had been in the ear of a lady for over fifty years, yet had never caused any trouble; she was not even aware of its presence; it finally became surrounded by the wax and so tightly wedged in the canal, as to completely occlude the passage, thereby causing deafness; the removal of the mass was followed by complete relief, and it was found that the drum membrane was not changed by the long continued presence of this object.

Too much stress cannot be laid upon the danger of using force in attempting to remove anything from the ear. The use of probes, forceps, ear spoons, is always fraught with considerable risk and should never be used except the ear is under the proper illumination, so that every movement can be plainly seen; even then a slight and unexpected movement of the child may in an instant cause the instrument to produce an irreparable injury. Be sure the object is seen in the ear before attempting to remove it with instruments; do not be deceived by the statement of patient or friends, for indeed it is quite possible they may be mistaken; such mistakes have frequently happened; to grope in the dark with a pair of forceps, or trust to the sense of touch to locate the substance in such a delicate organization as the ear, is not to be thought of for an instant. Any such manipulations are almost sure to drive the object further in, rupturing the drum head, and the result is, there is a foreign body in the tympanum instead of the canal, a condition that is very far from being desirable. In every text-book on the subject, will be found cases where the most deplorable results have followed the attempt to extract objects from the ear by forcible means; rupture of the membrane, inflammation of the tympanum, loss of the ossicles, destruction of the hearing, and even life, have all been known to follow this instrumental search for an article that has sometimes proved to be a phantom, only existing in the patient's mind, as a post-mortem examination has subsequently revealed that there had been nothing in the ear. The first thing to be done after it is once determined that a foreign body is in the ear, is to syringe with warm water, and right here it may not come amiss to say a few words concerning the selection and use of this instrument. The syringe should be constructed of hard rubber and its capacity may be one, two or more ounces; the piston should fit the barrel closely so as not to draw any air, and yet work smoothly to prevent any jerking motion; the nozzle is conical shaped with a slightly projecting tip; the ordinary glass instruments sold as ear syringes are entirely useless.

In syringing an ear, a napkin may be folded on the side of the neck, and a small bowl should be held close under the ear to catch the water; by these precautions all soiling of the clothing is avoided. The water to be used should be warm; *never under any circumstance should a liquid be put into the ear without first being warmed.* The auricle is taken between the finger of the left hand, and pulled in a direction upwards and backwards, thereby straightening the passage of the auditory canal, and a syringe full of the water derected into the ear; the first time the water should be thrown quite gently, in order that the ear may become accustomed to the slightest shock that may be produced, but afterwards the stream may be thrown more forcibly.

In the greater number of cases this treatment will remove the foreign bodies; the water gets behind the object strikes the membrana tympani, and in returning, washes everything out; this method is simple, efficient, easily available by every physician, and perfectly harmless. It may be necessary to continue the syringing for some time, or even see the patient several times before the foreign body is gotten rid of. For even after the syringe has been used for several minutes, the ear may become irritable, and not bear any further handling for the time. It may be of advantage to have the patient change his position, incline the head to one side, or even lie down with the affected ear turned downward, and syringe from below, thereby taking advantage of the force of gravitation. If when a case is seen there have been previous efforts made at forcible extraction, the canal will probably be found wounded, swollen, highly sensitive and irritable; if such be the condition do not add to this by any further attempt at extraction, for it would only do harm patient some soothing preparation, as *Hamamelis*, *Calend* may be diluted with water or *Glycerine*. This should be w. dropped into the ear several times a day, which will tend the inflammatory symptoms in two or three days, when th.

may be resorted to. The canal being narrower at a point about midway between the auricle and membrana tympani, if a foreign body becomes lodged beyond this isthmus, and much swelling has taken place, it becomes impossible to extract it without causing considerable laceration. If after the syringe has been thoroughly tried and found to be ineffectual, instrumental means may have to be resorted to. In such a case the child had better be under the influence of an anæsthetic, so that no sudden movement shall be the cause of any injury, if forceps are used they should be bent at an angle so that the hand will offer no obstruction to the light; a loop of fine wire has been passed around the foreign body and extraction made in this way; this instrumental procedure is less devoid of danger than other methods; in case of peas, beans and other seeds which have become swollen from moisture, the galvano cautery has been used for the purpose of breaking them up; other methods have been recommended such as applying glue with a camel's hair brush, and letting it remain until the glue becomes hard; another, somewhat similar, is to apply a small bit of adhesive plaster which is attached to a string, then by means of a bi-convex lens to concentrate the sun's rays upon it until heat enough has been obtained to cause it to adhere to the foreign body, but these methods would appear to be more fanciful than practicable. One thing must be distinctly remembered that all instrumental manipulations must be made with the canal, and the object plainly visible, made so by the proper illumination. Hinton, an eminent English authority on the subject, has said "that whenever an instrument will succeed, syringing would also succeed, and that when proper syringing will not succeed, all instruments are full of danger."

SUPPURATIVE INFLAMMATION OF THE MIDDLE EAR.

This disease may exist either in the acute or chronic form. In the acute variety, the first symptom usually noticed is an itching and feeling of fullness referred to the bottom of the canal or deep in the ear. This is soon succeeded by pain which rapidly increases in intensity, and sometimes becomes so violent that convulsions supervene. Tinnitus aurium, hardness of hearing, and vertigo are usually present. Pain is not always present, or if it is may be very slight; a slight itching and feeling as though the ear was stopped up, being all the sensations that precede the purulent discharge.

This, however, is not frequently the case, the pain usually being of the most agonizing nature; no comfortable position can be assumed, no rest can be obtained; every motion incident to chewing, swallowing, coughing or sneezing produces the most intense aggravation; even a strong man may be forced to shriek, so terrible is the suffering, but if the patient is an infant the actual condition may be mistaken for brain trouble, all the more so if convulsions should happen to be present. These symptoms are usually relieved by a rupture of the drum-head and discharge of the purulent contents of the tympanum. When we recollect the anatomical construction of the tympanum, that it is a small cavity with dimensions of less than half an inch, that it is bounded on all sides save one with bone, that it is lined with a mucous membrane richly supplied with sensory nerve fibres, that this same mucous lining also serves as a periosteum to the bony walls, when we remember these important points it can be readily understood why any swelling of the tympanic lining which must occur during an acute inflammation will give rise to such excruciating suffering, and how great must be the danger from confining a purulent matter in a space of such vital importance.

The objective symptoms are usually confined to the membrana tympani, the canal seldom participating in the inflammation. If examined when the first symptoms are felt, the drum-head will be found slightly reddened at its periphery, also along the handle posteriorly may be seen a leash of blood vessels; the peculiar lustre of the membrane is diminished and the cone of light not nearly so prominent. Gradually this congestion increases until it covers the entire surface and the whole membrane is of a pinkish or even coppery color; the cone of light entirely vanishes as may the handle, and even the short process of the malleus; in fact all the details of the normal membrana tympani are obscured or entirely disappear, and at the bottom of the canal is seen an undefined red diaphragm. This latter condition is only noticed in the severer cases.

The formation of pus usually gives rise to a slight bulging in the posterior half of the drum-head, this locality being the most frequent spot where perforation takes place. If pus has already escaped a perforation will be found; it may be very small and almost detection, but inflation by the Politzer method will cause escape, giving rise to that peculiar whistling sound which is teristic of an opening. The patient may be able to do this him performing what is known as Valsalva's experiment; this is a plished by holding the nose and forcibly expiring with lips closed. The perforation may be very large in some cases, the whole drumhead being destroyed. It is very exceptional that a double perforation exists though it occasionally has been seen; in these cases one is anterior and the other posterior to the malleus. The discharge is purulent in its nature and generally very copious; it may be thin and watery; oftener thick, yellow and creamy; not infrequently it is streaked with blood and in some cases it seems composed entirely of blood; the odor is often very offensive, though this is more apt to be the case in chronic suppuration. Acute pharyngitis often accompanies acute suppuration of the tympanum.

Causes.— Among the many causes that may give rise to acute inflammation of the middle ear, the exathematous diseases stand first in the list, and among these diseases probably scarlet fever causes more cases and severer ones than any of the others. Exposure to cold in its various forms is a very common cause of acute otitis media, and to quite a number of cases can be assigned a traumatic origin. A blow on the auricle may be all sufficient to rupture the drum-head and induce acute inflammation; cases also have been observed as the result of concussion from the firing of a cannon. Too often this disease has been brought about by forcible and unskillful efforts at extracting foreign substances from the auditory canal.

Prognosis.— This is usually favorable though it must be modified by the cause of the disease and the general condition of the patient. It is rarely that an ordinary uncomplicated case of *acute otitis media* is fatal to life. Those cases which are the result of the exanthemata are the least favorable because usually neglected. Any previous disease of the ear or any malformation of the canal which would prevent the free exit of pus, would necessarily interfere with the treatment and recovery.

Treatment.—The first thing that the physician will be called upon to relieve will be the severe pain from which the patient is suffering during the first stage of the disease. Here hot applications will be beneficial, and in some cases prevent the formation of pus, though this will not often be the case. Hot water is about the best substance that can be used, though it can be medicated with extract of *Hamamelis* or a few drops of tincture of *Capsicum*. It should be as hot as can be borne, and is best applied by a nasal douche, fountain syringe or some such instrument. The ordinary ear syringe may be used, though the water should not be thrown in with any force.

In a large number of cases this warm irrigation will relieve the acute suffering. If the pain persists, Magendie's solution of *Morphia* may be more effectual; the strength two grains to the dram of water; it should be well warmed and from five to ten drops can be put into the ear. In no case should any form of a poultice be used. They can be of no use and often are productive of considerable evil. If in spite of these local means used the pain continues, paracentesis of the drum-head had better be performed. A narrow bladed cataract knife or cataract needle is the best instrument to be used for this operation. The opening should be made in the posterior half of the drum-head about midway between the periphery and the malleus. It should be done through the speculum and under the proper illumination. As the pain almost always ceases with the commencement of the purulent discharge, so this artificial opening if followed by a flow of pus will accomplish the same happy result. It is seldom there is any further pain after the membrane is once perforated, unless a fresh cold is taken; in this case the discharge may suddenly stop and the opening close; these relapses have to be treated in the same manner as the original disease. After the flow of pus is fairly established, great care should be taken to keep the ear thoroughly clean; this can best be accomplished by gently syringing the ear with warm water; a great deal more care must be exercised in syringing an ear affected with acute inflammation than where a foreign body is lodged in the canal; a very gentle stream of water may, when the drum-head is perforated may suffice to induce vertigo and nausea; this on account of the pressure brought to bear directly on the labyrinthine wall; where such a sensitive condition exists, it may be necessary to clean the ear with a fine probe, wound with absorbent cotton; in fact this method of cleansing is rather superceding the use of the syringe; it should only be done under a bright illumination where every movement of the probe can be seen. This method, however, cannot be entrusted to patients to be carried out at home. A certain number of cases of acute suppuration of the middle ear will recover with this treatment and the administration of some internal remedy which should always be given along with the local treatment. Other cases will be met with where the discharge does not cease but shows a tendency to become chronic; this condition will have to be met with by some astringent preparation which is to be warmed and dropped into the ear two or three times a day. Of the many astringents we possess, *Sulphate of Zinc*, *Nitrate of Silver* and *Alum* are those which are the most often resorted to; they should be used in a strength of from two to four grains to the ounce of water, and weaker still if any long continued pain or burning is felt from their application; from five to ten drops of *Carbolic acid* may be added to these solutions, especially if there is any bad odor to the discharge. Lately dry applications are being used quite extensively in the treatment of chronic suppuration, and in some cases they seem to act far more favorably than medicines in solution. *Borax Alum*, *Salicylic acid*, *Iodoform* and *Boracic acid* have all been used with beneficial results in checking this purulent discharge. Particular care should be taken to have the substance finely pulverized, for even then there is sometimes a tendency for the powder to form hard concretions, when mixing with discharge, which may be difficult to remove; an ear that is being treated with these dry preparations should be very closely watched. Acute suppuration of the middle ear if properly cared for need very seldom run into the chronic form; the reason why there are so many cases of uncured chronic otitis media is that the difficulty is considered by many as trivial and unimportant, this view being encouraged by many physicians. During the occurrence of the exanthematous disease, at the very time when the ear needs the closest watching, very often no attention is given to it. It should be borne in mind that the treatment necessary for the ear, will not in the least interfere with that necessary for the general disease. There need be no fear of checking a discharge from the ear too quickly. Unhesitatingly it can be said that so long as the discharge continues, just so long is the patient in danger. So serious a matter is this considered by some English insurance companies that they refuse to take a risk on a person suffering from chronic suppuration of the ear. The consequences which this disease may lead to are any of them of a serious nature and may be mentioned as follows:

Permanent and incurable deafness, granulations and polypi of the tympanum, mastoid disease, caries and necrosis of the temporal and adjacent bones, meningitis, cerebral abscess, pyæmia, paralysis and death. Each and every one of these consequences are of sufficient magnitude to demand considerable mention, but lack of space here prevents any further enlargement of the subject, and the reader must be referred to the more extensive text-books on the subject for the details. What the writer is particularly desirious of, is to impress upon the practitioner the necessity which these cases demand for careful treatment, and the dangers which are almost sure to follow if let alone. Among the remedies to be administered in acute suppurative otitis, *Aconite*, *Belladonna*, *Gelsemium*, *Hepar sulphur*, *Mercurius*, *Pulsatilla*, and *Veratrum viride* stand pre-eminently at the head of the list. *Aconite Gelsemium* or are to be thought of in the first few hours when the mucous membrane is engorged and swollen, the pain intense, and before the formation of pus. If these remedies are given promptly the formation of pus can sometimes be prevented. *Belladonna* is to be given where together with the earache there is a great deal of headache, red face, twitching of the facial muscles, delirium and tendency to convulsions. *Hepar*, *Merc.*, and *Puls.* are oftener indicated when the formation of pus is inevitable, which will invariably be the case if the pain does not stop during the first twenty-four hours; also if pain or a great deal of soreness persists after a discharge of pus.

The principal remedies used in the chronic variety, are: *Arsenicum*, *Arsen. iod.*, *Aurum*, *Baryta carb.*, *Calcarea carb.*, and *phos.*, *Graphites*, *Hepar sulph.*, *Hydrastis*, *Kali bich.*, *Kali hyd.*, *Lachesis*, *Merc. sol.*, *Merc. cor.*, *Nitric acid*, *Silicea*, and *Sulphur*. The treatment will often have to be very protracted, especially so, if the disease has been running for years, and a good deal of patience will be required both on the part of the physician and patient to bring about a successful termination.

The fact should never be lost sight of that the consequences of chronic suppuration are disastrous and often fatal, but by a careful and persistent treatment, these may be avoided and the greater number of the cases cured.

GENERAL DISEASES.

HELMINTHIASIS.—WORMS.

Intestinal worms may exist in considerable number, and for a long time, in a child without attracting notice by any symptoms, though they may reveal themselves by indications which may be local, general, or reflex. It is inferred that a child suffers from worms when it picks its nose, grinds its teeth at night, has a voracious and capricious appetite, looks pinched and thin at the bridge of the nose, and dark around the mouth, has a tumid belly, dark rings around the eyes, is often sick, and complains of itching at the anus. Dr. Eustace Smith describes the tongue of worms as slimy, thickly furred, with enlarged papillæ at the side. But none of these symptoms are actually diagnostic; *seeing* the worms or parts of them pass away, is the only infallible indication of their presence. (Steiner.) Many causes besides the presence of worms give rise to a tumid state of the abdomen, to colicky pains, occasional sickness and vomiting; and itching of the nose and anus though often present when the intestinal canal is infested with worms, yet is sometimes the occasion of much annoyance independently of their existence. An irregular or intermittent pulse, widely dilated pupils, occasional drowsiness, with uneasy restlessness at night, and starting during sleep, are evidences of disturbance of the nervous system, but do not specially indicate the presence of worms as the cause of such irritation. The presence of worms, just like any other source of irritation, may excite convulsions, or may disturb in other ways the functions of the nervous system. (West.) It should be remembered that lymphatic children are the most likely to be infested with worms. Many so-called worm symptoms are due to gastric catarrh and to small fissures at the anus.

There are five different species of worms found in the intestinal canal. These are the ascaris lumbricoides, or round worm; ascaris vermicularis, thread worm, seat worm, or as it is popularly called, ascarides; tricocephalus dispar, or long thread worm; tenia solium common tape worm, or long tape worm; and the bothnocephalus lata, tenia lata, or broad tape worm. The first three varieties are known as cœlelmintha or hollow worms, having an abdominal cavity, and the last two as sterelmintha or solid worms, having no abdominal cavity.

The Ascaris lumbricoides, or lumbricoid worm is shaped not unlike the common worm, having a cylindrical body, which is attenuated toward either extremity, but particularly the anterior, and varies in length from five inches to a foot in length. The head is at the smallest extremity and may be distinguished by a circular depression, around which may be seen three tubercles. The integument is marked by circular fibres; the color of the worm is whitish, yellowish or more or less deep rosy in tint, and when recently voided are somewhat transparent. The female worm (for they are of both sexes) is much more common than the male. The genitals of the male consist of a double penis, which may sometimes be seen to protrude just in front of the caudal extremity; those of the female may be distinguished by the vulva seated at a constricted point of the body, about a third of the distance from the head to the tail. The habitat of these worms is the small intestines. They may and do pass upwards, into the stomach, or downwards into the large bowel; in either case they are very soon voided. Sometimes they are vomited up; but they have been known to creep into the œsophagus, and thence into the nostrils. They often lie in packets, and are very numerous. Sometimes two worms are met with, sometimes one only. So that it cannot be inferred with certainty, that because one such worm has been voided, more remain behind; although that is always probable. According to Guernsant, infants at the breast under six months of age are very rarely affected with them. It is believed that the disposition to worms is hereditary in some families; is more common in girls than boys; is most common in children of lymphatic and scrofulous constitutions; and that a too exclusively vegetable and milk diet, and an abuse of fruits, strongly predispose to their production. It is also a general belief that a feeble and disordered state of the digestive function from any cause, often acts as a predisposing cause of worms, and particularly of lumbricoides.

Symptomatology.---Children affected with lumbricoides are said to present a peculiar physiognomy; the face is usually paler natural, and sometimes has a leaden tint; the eyes are surroun bluish rings, and have at the same time a dull and languid expression; the inferior eyelids are often swollen and puffy; the sclerotic coat of the eye assumes a bilious tint; the nostrils are sometimes swelled, and the child complains much of irritation and itching of those parts, and is constantly picking at them with the finger. The stomach is more or less deranged, as shown by furred tongue, eructations, variable appetite, which is sometimes diminished, and sometimes increased thirst, acid or heavy breath, and nausea. The abdomen may be enlarged or retracted, hard or tumid; the bowels are sometimes costive, sometimes affected with diarrhœa. The stools, glairy substances, and are sometimes streaked with blood, and of a yellowish, green color, and the patient often suffers from colics, either dull or acute, which are referred to the umbilical region. The child is generally pale and thin, indolent and languid, irritable and unhappy. The sleep is almost always disturbed; the patient is restless, waking in fright, constantly tosses and turns in sleep, moans or grinds the teeth. These symptoms are signs both of worms and chronic functional disorders of the stomach and bowels, and may exist independently of the presence of worms, the only certain sign of which is their expulsion from the patient.

The Ascarus or oxyuris vermicularis is the smallest of the intestinal worms. The sexes are in different individuals, and here, also' the female is longer and larger than the male; the one being perhaps half an inch in length, the other about two lines long, and very slender. They are whitish and look not unlike pieces of cotton thread, whence one of its names is derived. The anterior part of the body is of the same shape in both sexes. It is obtuse and surrounded by a transparent membrane, through which may be seen a straight tube, forming a kind of bladder, which is the œsophagus, and which terminates in a globular stomach. The head is provided with three tubercles, as in the lumbricoides. These thread-worms live principally in the rectum, and sometimes are collected there in vast numbers —thousands; and they pass out, or are ejected matted together with mucus in the shape of balls, or entangled in portions of excrement. Sometimes they emerge of their own accord, and crawl about, getting into the vagina in females, and even into the urethra, and causing intolerable irritation, itching and distress.

Symptomatology.—The characteristic, and often the only symptom indicative of their presence, is violent itching about the anus, which is sometimes insupportable, and which is generally most troublesome and most apt to occur at night when the child is in bed. In some instances they give rise to acute and violent pain in the region of the anus, and sometimes to tenesmus and mucous or bloody stools. When the last named severe symptoms exist, the worms may occasion dangerous nervous disorders, and even give rise to general convulsions.

The diagnosis of the seat-worm, like that of the lumbricoides, cannot be regarded as positive unless some have been expelled, or unless they can be seen by examination of the rectum. This can generally be done when they are present in any number by pressing the nates apart so as to open the anus, and bring the folds of the mucous coat of the bowel into view.

The tricocephalus dispar is the long thread-worm. It is from an inch and a half to two inches in length. One extremity, that to which the head belongs, is extremely fine and small, and then suddenly bulges out a thicker body. The thinner portion is about twice as long as the thicker, and the latter is rolled up in a spiral form, especially the male, the female being straight. This worm is of a white color, unless tinged by its food. It also affects the large intestine as its place of abode; but the opposite end of that gut, the cæcum, is its favorite spot.

The second class of worms are the sterelmintha or solid worms; those without an abdominal cavity. The varieties of this class met with in children, are tenia solium, tenia mediocanellata and bothiocephalus latus.

Tenia solium may be seen in great lengths, consisting of numerous joints, like melon seeds. The head is small, and is provided with four sucking discs, a rostrum and corona of hooklets. The joints are whitish in color and quadrilateral in shape. Very short, small, and indistinctly marked in the creature's neck, they become gradually larger and square as the distance from its head increases, and finally, longitudinally oblong. The perfect joints have at the margin perforated prominences marking the genital orifice, these appearing alternately on the right and left sides. Each joint is capable of producing thousands of fertile ova. Habitat, small intestines.

Tenia mediocanellata differs from the tenia solium in that its he has no corona of hooklets, though provided with four suckers. posterior joints are exceptionally broad and thick ; the genital can are lateral and alternate irregularly. Its habitat is the small int tines.

In the *bothriocephalus latus* the joints are as broad as long, and lie over one another like the tiles of a roof. The head has no sucking cups nor hooks, but only two cleft-like suckers. The sexual canals are not lateral, but placed in the middle of the joints.

Symptomatology.—Very frequently the presence of these worms is never suspected, from an utter absence of any symptoms, until the passage of joints has been noticed. In other cases they give rise to such symptoms as loss of appetite or inordinate hunger, frequent transient, colicky pain round the umbilicus, feeling of pressure and burning over the abdomen, itching at the nose and anus, squeamishness and tendency to vomit, especially in the morning when the stomach is empty, headache, fits of loss of power, restless sleep, grinding of the teeth, and nervous attacks resembling chorea, eclampsia, or epilepsy.

The treatment of worms consists in putting the mucous membrane in a healthy state and in expelling them, or in both. Homœopathy has no vermifuges as such, although *Cina* and *Merc.* often act as such. For tenia, such agents as pumpkin seed tea followed by oil or *Filix mas.*, *Kousso* or *Punica grav.* have usually been efficient in dislodging the worm. The first agent dislodged twenty-nine feet of tænia in a child under one year for the author. As this worm is introduced into the system in the cysticerus state, it will develop, unless dislodged, head and all.

One of the following remedies may be indicated for the totality of the symptoms in a given case, and particularly for the round worms, or for the so-called worm symptoms, including gastro-enteric catarrh and fissure ani :

Aconite.—Pain in bowels ; umbilical region hard, whole abdomen bloated ; urging to stool without discharge, or slime only ; nausea ; accumulation of water in mouth ; restlessness at night on account of intolerable itching and tingling at the anus, throwing the child into fever.

Apocynum and.—Severe sneezing, with great itching and irritation in nostrils ; excessive nausea and vomiting ; tickling sensation at end of penis ; ascarides.

Argentum nitr.—Periodical pain in hepatic region and around the navel, with sickness at stomach, retching, vomiting of tough mucus.

Asclepias syriac.—White tongue ; excessive nausea with violent headache, diuresis and inclination to stool, and still increased appetite ; tickling sensation at end of penis ; ascarides.

Belladonna.—Drowsiness, starting in sleep, grating of teeth, involuntary discharge of fæces and urine, or dysuria; squinting.

Calcarea carb.—Headache, dark rings around the eyes; pale, bloated face; thirst; thick, bloated belly; aching about the navel; diarrhœa; easy perspiration from motion; scrofulosis.

China.—Pain in belly, worse at night, after eating; fulness of abdomen; pyrosis; pressure in stomach, and retching; tremulous weakness all over.

Cicuta.—Frequent hiccough and crying; pain in neck; spasmodic drawing of head backwards, and tremor of hands.

Cina.—Restless sleep, with rolling of eyes, dark rings around eyes; squinting; enlarged pupils; constant rubbing the nose; epistaxis; face pale and cold, or red and hot; loathing of food, or great hunger; nausea, vomiting; pain in umbilical region; abdomen hard and distended; constipation; dry hacking cough at night; feverishness; convulsive motions of head and limbs.

Dolichos prur.—Bloated, swollen abdomen, with constipation; cough most troublesome about bedtime, and for awhile after going to bed; intolerable itching all over body.

Euphorbia.—Loss of appetite or voraciousness at times; furred tongue, feverishness; fetid breath; bloated stomach; constipation or diarrhœa; emaciation, peevishness, wakefulness.

Ferrum.—Pale, wretched complexion, easily flushing; itching at anus from pin worms, at night; involuntary micturition.

Filix mas.—Gnawing and boring in bowels, aggravated by eating sweet things; constipation; loss of appetite; furred tongue; pale face; blue rings around eyes; itching of nose; irritable and cross.

Ignatia.—Itching at anus from pin worms; convulsions, with loss of consciousness, and temporary inability to speak.

Kousso.—Indigestion, loathing; sleeplessness; weakness, with fainting; profuse and cold perspiration; emaciation; dull pain in bowels; bloatedness; constipation.

Lycopodium.—Arthritic pain and stiffness; chronic eruptions; wretched, dirty, pale, earthy complexion; flatulence, bloating of the stomach and abdomen; sensation of something crawling and moving in bowels and stomach, up and down; constipation.

Mercurius.—Continuous greediness for eating, and still becomes steadily weaker; fetid breath; itching of anus; inflammation of vulva; seat and round worms.

Podophyllum.—Rolling of head in children; reflex irritation of the brain from disorders of bowels; grinding of teeth at night; copious salivation, offensive odor from mouth; tongue full and broad, with a pasty coat in centre; sour regurgitation of food; bloated abdomen; painful diarrhœa, with screaming, and grinding of teeth; prolapsus ani.

Punica granatum.—Vertigo, wavering before eyes, enlarged pupils; yellow complexion; grating of teeth; accumulation of water in mouth; changing appetite; gulping of watery fluid; vomiting; sensation of something moving in stomach; bloated bowels, colic; palpitation of heart; spasms; syncope; night colic.

Sabadilla.—Vomiting of round worms, or nausea and retching, with sensation of a worm in pharynx; or in case of tænia, burning, boring, and whirling in umbilical region; accumulation of water in mouth; chilliness and sensitiveness to cold; sensation as if abdomen were sunken in.

Spigelia.—Nausea every morning before breakfast, always better after breakfast; dilated pupils, squinting; pale face; smarting in nose; sensation of a worm rising in throat; better after eating, or vomiting of all she takes, with sour rising like vinegar from stomach; pain in bowels; dry, hard cough at night, palpitation of heart.

Silicea.— Worm colic, with constipation or difficult stool, yellow hands, blue nails, or with reddish, bloody stools; flatulence, much rumbling.

Stannum.—Dull mind, pale face, sunken eyes; flushes of heat in face from movement; fetid breath; hunger, cannot eat enough, except in the evening; nausea after eating; gone feeling in epigastrium, even after eating; profuse and pale urine; restlessness; the

Sulphur.—Creeping in nose, creeping and biting in rectum, passage of lumbrici, ascarides, and tænia; nausea before meals, and faintness after dinner; restlessness at night.

child moans during sleep or supplicates in a timid manner.

Teucrium.—Terrible itching in anus from pin worms.

Consult also Diseases of the Stomach, Foods and Rectal Diseases.

RICKETS.—OSTEOMALACHIA INFANTUM.

RACHITIS.—RHACHITES.—SPINA NODOSA.—RACHITISMUS.—MORBUS ANGLICUS.

A constitutional disease, characterized by an unhealthy state of the system, which precedes for several weeks or months a peculiar lesion of the bones and of some of the solid visceral organs. The lesion in the bones is characterized by irregularity in their growth, by non-solidification of the growing layers of the bone, by the progressive formation of medullary cavities in the older and more mature bone, thus rendering the bony laminæ thin and brittle. (Virchow.) There is generally albuminoid (amyloid ?) degeneration of the spleen and liver.

This disease is of frequent occurrence in England, Germany and is spoken of by Sir W. Jenner as "without question the most common the most important, and in its effects the most fatal of the diseases which exclusively affect children." While this statement may be true of London, it certainly does not apply to the large cities in the United States.

Etiology.—Considerable difference of opinion exists upon the question whether rickets is hereditary or not, but there seems no evidence to show that it ever is so, in the sense for example, in which infantile syphilis is hereditary. There can, however, be no doubt as to the great influence exercised by the health of the parents upon the development of the disease. It is stated by some authors that too early marriages, or marriages between relations, and chronic tuberculosis, or constitutional syphilis of the father, predispose to it. These are doubtful causes, The history of the disease, however, appears to show that there are predisposing causes derived from the parents, which are so capable of influencing the health of the child as to lead in the course of time to the establishment of the disease now under consideration. This is quite different from a child inheriting rickets as a disease which the parents had, and which they transmitted to its constitution. As opposed to the belief which regards rickets as degenerate form of syphilis is the fact that parent who infects his spring with syphilis, has usually contracted that disease bef marriage, and the children first begotten after infection are those w suffer from inherited syphilis; while as a rule it is only the later chi dren of the family that suffer from rickets. Jenner is very skeptical as to the influence of the father, but believes that the health of the mother has a decided influence in the development of rickets in the child. Thus it is well ascertained that whatever tends to induce debility and anæmia in the mother, as too frequent pregnancies, or prolonged lactation, and this without being the subject of actual disease, renders it highly probable that her next born children will be rickety. It is very common for the first, or the two or three first born children, to be free from any sign of rickets, and yet for every subsequent child to be rickety; moreover, if a woman bear one rickety child, in the majority of cases all her subsequent offspring will be rickety. This is explained by the fact that among the poor, the parents are worse fed, worse clothed and lodged, the larger the number of their children; and among the rich and poor alike, the larger the number of children, the more has the mother's constitutional strength been taxed, and the more likely is she to have lost in general power. In addition to the tendency derived from the mother, there are numerous causes acting directly upon the child, which strongly predisposes to the disease. Thus premature wearing and the substitution of improper food for the mother's milk, or on the other hand the continuance of suckling long after the mother's milk has deteriorated in quality and become insufficient and unwholesome; or the use of indigestible, or of poor, scanty and innutritious food at any period of early childhood, are all potent causes of rickets. So too many of the acute and chronic diseases of children, which impair assimilation and nutrition, as entero colitis; and all such depressing influence as impure water, foul air, poor ventilation, small, damp and dirty habitations, may be classed among the predisposing causes. Trousseau states that of a hundred rickety children, ninety-eight were either never suckled at all, or were weaned very early. Lonsdale has invariably found that in all rickety children, the parents have had little or no milk for their supply, and have been obliged to feed the children either partially or wholly with food other than the milk of the mother. The mothers observe that the children never grow properly from the first, and it is mainly due to the *improper nature of* the supplementary food " given by hand."

Pathology.---The local lesions of this disorder have sometimes been looked upon as the real disease. Hence it is that rickets has so frequently been classed among diseases of the bones, and are described with reference to softening of the bones only and alone, which is a mere expression (and only one expression) of a general morbid state. Rickets therefore can no longer be regarded as a local disease, characterized by a mere chemical abnormality of the bones—a mere deficiency of their earthly salts. Not only is there an insufficient deposition of lime salts in the growing extremities of the long bones, but the amount which is deposited there is abnormally placed as regards the anatomical constitution of bone. It is found in the cartilage cells instead of in the matrix. And not only is there a deficiency of the lime salts, and an abnormal position of those present; but if the bones were hard before the disease began, they begin to soften in consequence of the absorption of lime from the shafts of the long bones and from the substance of the flat bones. The earthy matter in a soluble form enters the blood and is excreted by the urine. Moreover, in rickets the growth of bone is abnormal, irrespective of the absence of lime. It has been supposed that an excessive formation of acid in the stomach of the child finding its way into the blood, facilitates the removal of the earthy salts from the bones. The particular acid is variously stated to be *Lactic*, *Oxalic*, *Phosphoric* and *Hydrochloric acids*. While it is fully proven that in rickets as in most other constitutional diseases, a superabundance of free acid is generated in the *primæ viæ*, still all children who suffer from the generation of free acid are by no means sufferers from rickets. It is the absorption into the blood that causes the trouble.

Pathological Appearances.—The diminution of the consistence of rachitic bones is very remarkable. Incisions may be made several lines in *depth*, and when in an advanced stage may be cut through without notching the knife. The periosteum thicker than usual is of a rose-red color, though milky in appearance in some places, and when pulled off, small, and sometimes large fragments of bone remain adhered to it. The frontal bones, are thickened more or less, and the anterior portion of the parietal bones partake in this thickening, while their posterior portion are nearer the normal, or both, it and the occipital bone present membranous spots, from which all osseous matter has been absorbed. By holding the cranium up to the light, the extent, as well as the degree of this rachitic thinning, called *craniotabes* is clearly seen. Examination of the thorax shows a thickenin at the ends of the ribs which gives to the wall of the chest a pec beaded appearance. Associated with this beading is an ext degree of pigeon-breast; the sides of the chest are flattened, the num carried forwards, the ribs bent inwards at an acute angle at point where the bone and cartilage unite, forming a deep perpendicular groove on each side, while the xyphoid cartilage extremely movable and projecting, forms a deep pit in the scrobiculus cordis. Curvatures of the dorsal and lumbar spine exist in marked degree, and are mainly the consequence of muscular weakness and softening of the bodies of the vertebræ. The pelvis is small, its front wall is flattened and forced back upon the sacrum, the premonitory of the latter becomes unusually salient and the ilia are displaced backwards so as to overlap the sacrum. The bones of the thighs and legs are often bent in a variety of fantastic forms and at the same time flattened. There are enlargements of the epiphyses of the long bones. This enlargement of the growing ends of the long bones is an actual hypertrophy. In addition to these changes in the bones, there are certain lesions of the viscera, which depend partly upon the deformities of the skeleton, and partly upon the general cachexia. In consequence of the deformity of the thorax the anterior borders of the lung tissue corresponding to the groove at the sternal end of the ribs is compressed and collapsed. The pericardium presents a white patch or spot near the apex of the heart, due in all probability to friction against the depressed fifth rib. White patches also occur on the spleen, similar in nature and origin to those of the heart. The spleen is greatly enlarged. The liver, spleen, kidney, and lymphatic glands are the seat of albuminoid degeneration.

Symptomatology.—It is doubtful whether rickets ever begins before the birth of the fœtus. During the first four or five months of life also the disease is very rare, while in the great majority of cases it makes its appearance between the fifth month and the end of the second year, becoming less frequent each succeeding year and is rarely seen after the close of the seventh year. The alterations and deformities of the bones, characteristic of rickets are not developed until after a more or less marked cachectic state of the system has persisted for some time, varying from a few weeks to several months. During this stage the most marked symptoms are connected with the digestive system ; the appetite may be good or grow capricious, the bowels irregular, or there is a greenish, mucous, subsequently serous watery diarrhœa, of a brownish or slate color, and horribly offensive. The child is dull and languid, averse to play, and although drowsy, sleeps but little. There is low, febrile irritation present, the skin is hot and the child drinks large quantities of water. It complains of pains in the joints or along the bones; the face is pale, the flesh becomes soft and flabby, pulse is quick, the superficial veins enlarge, especially the jugulars, the hair continues thin upon the scalp, and the fontanelle remains widely open. But in each or all of these phenomena there is, as yet nothing diagnostic of rickets. They may accompany or usher in other maladies. In the second class phenomena are those symptoms commonly present during the development of rickets which at once mark the nature of the disease. The first of these is a profuse perspiration of the head; or of the head, the neck, and upper part of the chest. It is especially when the child sleeps that these copious perspirations occur, but they are not infrequent at other times, as when the child is at the breast, or even resting its head on the mother's arm. At the same time the superficial veins of the scalp are generally large and full, the jugular veins much dilated, and sometimes the carotid arteries may be felt strongly pulsating. While the skin is generally moist during the day, during the night the abdomen and extremities are usually dry and hot, at the time when the head, face and neck are bathed with perspiration. Another symptom of especial importance is the desire and the efforts made by the little patient to be cool, particularly at night, and this even in cold weather. During this restlessness at night it bores with the head into the pillow, or rubs the back of its head on the place where it rests. On waking in the morning, it will cry if the occiput is pressed, or when the head is lifted up and washed. The head is found to be more or less denuded of hair. The skull feels thinner than usual. The cranial bones may be found very soft in certain points, yielding elastically like card board beneath pressure. A third characteristic symptom is general tenderness. The child cannot be moved without uttering a cry; pressure on any part of its body is followed by like evidence of suffering. It lies with outstretched limbs as quietly as possible, for voluntary movements produce pain. Not only is the child unwilling to be moved, but it is often in terror lest it may be moved, and will cry at the approach of those who have been accustomed to dance it.

With the phenomena already mentioned, the urine is more abundant than in health, and deposits a calcareous sediment, or abounds in the phosphates. As the disease progresses the general appearance of the child becomes more significant of the disease. Its face gro broad and square, and when it is placed upright on its mother's ar sits, (as she says) "all of a heap." Its spine bends, and its muscl are too weak to keep it erect. The head thus comes to sink betwee the shoulders, and the face turns a little upwards. The next set of phenomena are those of deformity of the skeleton already noticed.

The growth of the teeth is also interfered with. In cranio-tabes the thinning of the occipital bone is so extreme that the osseous tissue disappears in spots, leaving the pericranium and dura mater in contact. The scapulæ are in a few instances so deformed as to embarras more or less the movements of the shoulder. The abdomen is unusually large and tumid, and the spleen and the lymphatic glands situated in the neck, axillæ and groins are all considerably enlarged. Laryngismus stridulous is commonly present. The child continues to become more languid and weak and all the symptoms increase in intensity, and death takes place from the supervention of some secondary disease, such as catarrh with general congestion of the lungs, general bronchitis, effusion into the pleura, gastro-intestinal irritation, chronic hydrocephalus, convulsions, or persistent diarrhœa. In cases where the disease approaches a favorable termination, the earliest signs of improvement consist in a decrease of the emaciation debility and suffering; the stools become more healthy, and the febrile symptoms, if any have been present, disappear. (Aitkin, Jenner, Smith, Ellis, Vogel, Meigs & Pepper.)

The treatment of richitis is hygienic and remedial. Pure air and proper food containing plenty of the phosphates are of prime importance. Milk and articles loaded with lactic acid may have to be avoided. (See Food.) In cases where the disease appears hereditary the value of *Calc. phos.* 6, and *Sulphur* during gestation should be remembered and given on alternate days. The early use of these remedies with the child may prevent the mal-assimilation that causes richitis. Teste says that "*Merc. sol.*, *Colch.*, and *Sulph.* are the fundamental remedies for richitis as their efficacy is notorious. With their aid I do not regard richitis as incurable." The remedies should be given, he thinks in the order named and repeated several times a day. *Phos. acid* is highly praised by Hartmann and Hughes. The latter adds *Siliceа*. *Staphysagria* when the front teeth turn black and crumble. *Calc.*, *Puls.*, *Merc.*, *Lyc.*, *Nux*, *Bryonia*, *Verat*, *Ipecac* and several other remedies may be needed, although it would seem that *Calc. phos.* covers these cases most closely. The inunction of oil should not be forgotten. Hartmann prefers Cod oil. Consult Hydrocephalus, Indigestion, etc.

CONGENITAL OR INFANTILE SYPHILIS.

Inherited syphilis may manifest its presence in the child at three different periods, viz., before birth, at birth, or after birth.

If *before birth*, it occurs usually from the fifth to the seventh month of uterine life. The child dies and is born dead before the proper time. This disease is so common a cause of miscarriage that when labor has occurred prematurely, suspicion should always be excited, and inquiries made as to the previous health of the parents, so that by proper treatment, the lives of succeeding children may be preserved.

If *at birth*, the symptoms are usually very severe. The child though born alive, is emaciated and looks shrivelled. He snuffles and cries hoarsely. A few hours after birth, an eruption of pemphigus appears, situated principally on the palms and soles of the feet. The bullæ become filled with a semi-purulent liquid, and burst, leaving angry looking sores. Spots of inflammation with abscesses are scattered through the thymus gland, and through the lungs. The liver is indurated. The infant may linger on for a few days or weeks, but these cases almost always prove fatal. Although appearing at birth, the symptoms are not, however, always so marked as those described. The amount of flesh may be considerable, and the lesions of internal organs may not be present.

If *after birth*, the child is born apparently healthy, is often plump, seems strong, and presents no symptoms by which even the most practiced eye could detect the lurking disease. Sometimes there is a something which seems to hint at the approaching outbreak. The face is rather old-looking; the skin inelastic and unnaturally pale; the complexion dull and wanting in transparency. After a time, varying from two weeks to six or seven months although rarely after the end of the third month, evident symptoms of the disease begin to be observed. Before this, however, there is a symptom which is seldom absent. This is obstinate wakefulness at night; the child is uneasy and fretful, cries almost unceasingly, and cannot be pacifi
During the day it is more composed, but every night there is a re
tion of the same disturbance, to the perplexity and distress of attendants. The crying is possibly excited by nocturnal pains in bones, similar to those affecting adults before the outbreak of c

stitutional symptoms. On the appearance of the eruption the sleeplessness does not at once subside, but soon disappears under the influence of specific treatment. The outbreak of the general symptoms may be determined by some febrile attack as one of the exanthemata, the eruption of which subsiding leaves the syphilitic rash in its place. (Eustace Smith).

The eruption, as in acquired syphilis, may vary much in its character, but the commonest are those of erythematous or papular character. If it is erythema the redness will show itself in abruptly margined patches, and will be characterized further by its peculiar red or coppery tint, compared by some authors to that of the lean of ham. Sometimes dry, scaly eruptions occur in infants, but these are rare. Pustular vesicular and bullous eruptions are of not infrequent occurrence. (Hutchinson). One form of eruption is usually first seen about the anus and perineum, appearing in flattened, slightly elevated spots, resembling in color, the rust of iron, and which with a lens, may be sometimes seen to be covered on their surface with minute scales. Usually, however, no scales are visible, as they soon become macerated by the natural moisture of the part. These spots are scattered over the perineum, surround the anus and speckle the scrotum or the labia. Sometimes the eruption begins as an erythematous blush, at first bright red, which covers the buttocks and perineum may extend to the lower part of the belly, and becomes more dingy. The colored surface is scaly, and at its edges are seen the rust-colored spots before described. The eruption is not limited to these parts; it often invades the folds of the joints, particularly the arm pits extends to the sides of the neck or the chin, and may be sprinkled all over the body. When ecthyma is present it is usually seated on the buttocks and perineum, and the pustules are more or less closely aggregated, the color of the part varying according to the number of the pustules. When crowded together, the general tint is a deep purple not uniform, but broken up into patches of purple, separated by intervals where the color is red. When the pustules are more widely apart, each one is seen to consist of a violet-colored blotch, crowned with a thick blackish crust, and surrounded by a deep red or copper-colored areola. The scabs cover an ulcer, which rapidly deepens, and, unless checked by early treatment, may penetrate deeply into the tissues, and produce very serious results. The ulcerations which arise from the other forms of eruption are often linear, and are compared by Trousseau to the narrow grooves found in worm-eaten wood. They frequently leave linear cicatrices, which may exist for a long time, an evidence of the past disease.

Mucous patches, when they occur on the skin, are seen as round or oval, slightly elevated patches, soft and something of the consistence of mucous membrane. Their color is reddish or grayish, and the surface is kept constantly moist by a thin offensive secretion. They are usually found by the side of the anus, between the fingers and toes, or anywhere else where the skin is especially delicate and moist. When they occur on the mucous membranes they appear as irregularly-rounded with elevations, in the centre of which a point of excavation shows itself; this spreads so that after a very short time only a single ulcer is observed. The skin of a syphilitic child is dry and parchment-like. At the same time as the eruption the little patient always displays the characteristic symptom known as "snuffles." In almost all cases it is one of the earliest signs of the disease. At first it presents the appearance of "a cold," but after a time the nasal mucous membrane is so much swollen that breathing and nursing are seriously interfered with. There is a profuse, sometimes sanious discharge from the nostrils, scalding the parts with which it comes in contact, and producing cracks and little ulcerations about the nostrils and upper lip, or it is of a thicker pus, which tends to concrete and block up the nasal apertures. The obstruction to respiration and the accumulation of secretion in the nasal cavities, gives rise to a peculiar snorting or snuffling, quite characteristic of the disease. Diday attributes the discharge to the formation of mucous patches on the Schneiderian membrane. In severe cases the ulceration thus set up within the nose may perforate the septum nasi, or lay bare the nasal bones which may become necrosed in consequence of the exposure. The bones may also become loosened and sink down, so that the bridge of the nose is flattened and looks broader. In rare cases snuffling is the only symptom of the disease; sometimes, but very rarely, it is completely absent throughout. At the same time there is apt to be a superficial diffuse inflammation of the mucous membrane of the mouth which may extend into the larynx. It is then not long before the voice becomes affected, and assumes a peculiar hoarse tone, which has been not inaptly compared to the sound of a child's penny trumpet, and which when once heard will at once be recognized as almost pathognomonic of syphilis. The hairs of the eyelashes and eyebrows often fall out; the edges of the eyelids then become scaly. The color of the face is yellowish, and this tint does not spread to the rest of the body, but remains limited to the face, where it is most marked on the more prominent parts, being less noticeable on the deeper parts. There is also a very striking pallor of the body generally. As a rule the fontanelle in children suffering from this disease is very widely open. Strangely enough, however, the growth and development of the teeth do not appear to suffer; indeed the contrary is found to be the case, for the teeth are often cut very early, and with remarkable ease. Iritis occurs in some cases, and has similar tendencies to those witnessed in the acquired form, and inflammations of the deeper seated tissues of the eye — the vitreous, retina, choroid — are frequent. Nodes of the long bones may be present, and indurated deposits occur in the areolar tissue, tendons, and muscles. The posterior cervical glands are often enlarged. The liver may be hypertrophied and indurated, either generally or partially, the enlargement being sometimes confined to one lobe. There is abdominal pain shown by moaning and uneasy movements of the limbs, vomiting, and diarrhœa or constipation. The abdomen is tympanitic and tender on pressure; the pulse quick and small, expression of countenance altered and features pinched and drawn. There is rarely any jaundice. Sometimes the pressure of the enlarged liver upon the vena cava may produce extensive œdema of the lower limbs and scrotum. The anatomical changes are due to the development of large quantities of fibro-plastic tissue, which compresses the hepatic cells, obliterates the vessels and consequently prevents the secretion of bile in the parts so affected. Such cases usually die in a few days.

In about one-half of the cases of hereditary syphilis the spleen is enlarged, so that it can be felt during life. In about one-fourth the enlargement is really great. Sometimes the spleen only is enlarged, sometimes enlargement of the liver or lymphatic glands is superadded. The majority of cases of great enlargement die; yet syphilitic children with a greatly enlarged spleen may recover ; the spleen gradually diminishing in size as the health improves.

Death very frequently ensues before the end of the first year, either in consequence of the severity of the coryza, and the inability to nourish the little patient, or in consequence of the profound cachexia and anæmia, or the development of the above visceral lesions.

When the child survives, the disease frequently subsides about the end of the first year; but often after remaining latent for a variable time, reappears in the form of tertiary symptoms. According to Hutchinson, this tertiary epoch may begin at any period after the fifth year, but may be delayed till at or near the period of puberty. A peculiar alteration of *the permanent incisor teeth* is considered by the above-named author to be pathognomonic of syphilis. The incisor teeth are dwarfed and sometimes the canines also. The teeth are narrow, rounded, and peg-like, and their edges are jagged and notched. Owing to their smallness their sides do not touch, and interspaces are left. When the other teeth escape the upper central incisors very rarely escape, and very often they are malformed when all the others are of fairly good shape. The characteristic malformation of the upper central incisors, consists in a dwarfing of the tooth, which is usually both narrow and short, and in the middle of its middle lobe. This atrophy leaves a single, broad notch (vertical), in the edge of the tooth, and sometimes from this notch a shallow furrow passes upwards on both anterior and posterior surface nearly to the gum. Sometimes the teeth diverge, and at others they slant towards each other. In a considerable number of cases of hereditary syphilis, the teeth show no deviation whatever from the normal standard, and in such the diagnosis must be guided by other conditions.

In very severe syphilis which develops itself several weeks after birth, paralysis of the upper, less frequently of the lower extremities occurs. These paralyses do not always extend over an entire extremity, nor are they always complete, for often a slight capacity of exercising some of the muscular groups remains behind. (Eustace Smith, Hutshinson, Gee, West, Vogel).

The *treatment* of congenital syphilis is *ante* and *post* natal, dietetic and remedial. Where syphilis is suspected the mother should be put upon the most nutritious diet and a dose of *Mercury* a day may be given during gestation. The attenuation should be varied. If no constitutional symptoms appear in the mother a dose of *Sulphur* and *Calc. phos.* may be given occasionally. If the mother is diseased the *Mercury* should be continued closely, and at birth the child should at once be put upon milk or one of the foods, if a healthy wet nurse is not at hand. If the disease only appears after birth the first symptom being usually a severe coryza, the first step in the treatment, if the child is nursed by the mother, is to remove it from the breast, great attention being paid to bathing and fresh air. Therapeutically the preparations of *Mercury* will here also generally be found th most beneficial, it meeting all the symptoms. According to Helmuth, the *Corrosive sublimate* or *Bichloride of Mercury* 3x is preferable, and has been of decided benefit, when other mercurials have failed. Next to this is *Kali hydriodicum* 1x which may be given in alternate weeks.

Nitric acid 200 has the reputation of curing the constitutional form, and may be given when the mother is diseased, or to the child during its subsequent years.

Aurum.—If the nasal or palate bones are affected; ozœna syphilitica.

China.—When the child appears very weak and has great coldness of skin. Also *Phos. acid.*

Hecla lava.—Destructive ulceration of the nasal bones.

Hepar.—Suitable where *Mercury* is not called for, especially when the mother has been treated with large doses of *Mercury*, or where there is induration of the glands and eruptions about the scalp.

Lachesis.—Where there is much sore throat, and dark ulcerated patches about the mouth, and where the infant "snuffles" or has constant coryza, with redness and excoriation of the Schneiderian membrane.

Mezereum is adapted to children who have a tendency to syphilitic exostoses, when the bones are large and the points swollen. It is closely allied to *Asafœtida*. Other remedies are *Asafœtida*, *Carbo veg.*, *Iris vers.*, *Kreasote*, *Phos. acid*, *Phytolacca*, *Sanguinaria*, *Thuja*, *Sulphur*. A word about the selection of food. It should be a fat food and most easy of digestion. (See Foods and Diseases of Glands, etc.)

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